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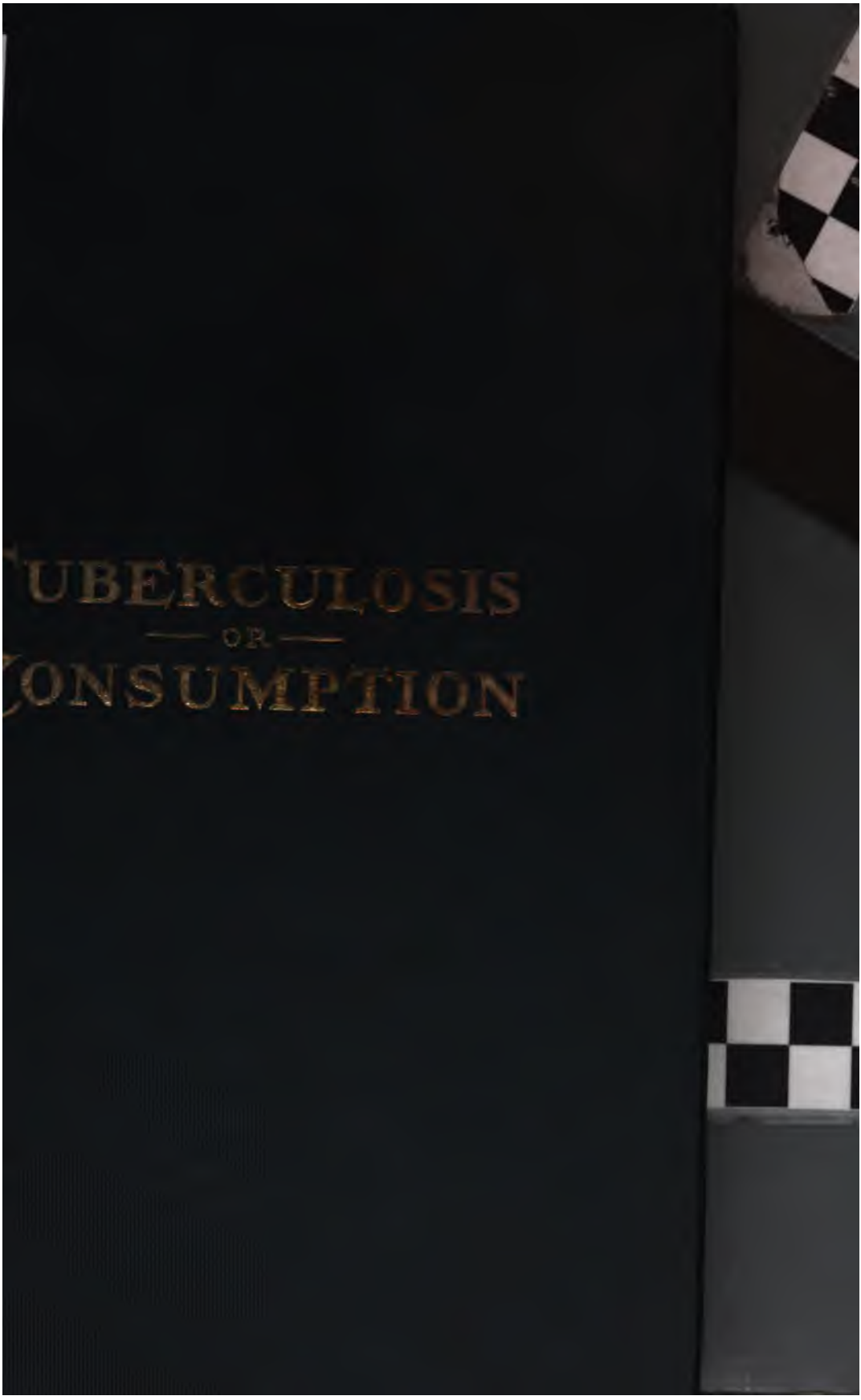
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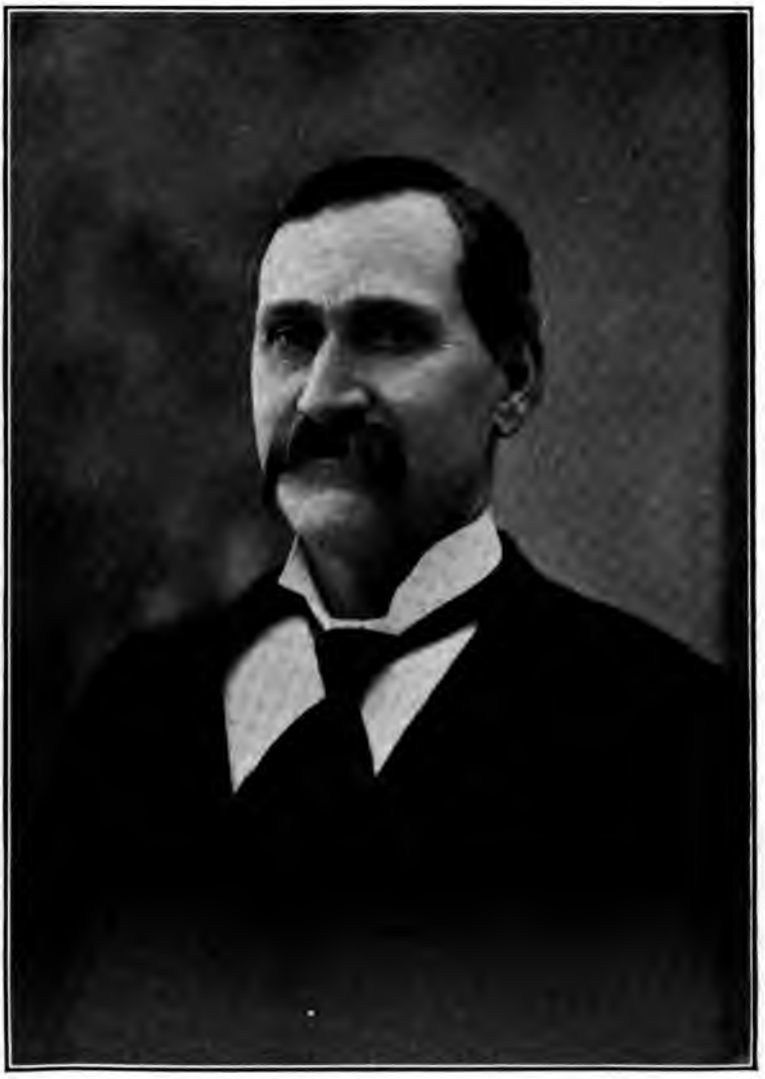

TUBERCULOSIS OR CONSUMPTION

— BY —

H. H. SPIERS, M. D.

OBERLIN, OHIO

FIFTH EDITION.
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OBERLIN, OHIO.

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1906

To
A Weak, Common
and
Suffering Humanity
These Articles
are
Respectfully Dedicated.

PREFACE TO FIRST EDITION.

In offering these papers for a second reading, it is the hope they will diffuse a brighter light by a collective rendering. Short articles, given from time to time, on various topics, and in many journals, seldom come under the eye of one individual. Hence the necessity of unity in presentation. The intractable nature of tuberculosis is our only apology.

Respectfully,

Ravenna, Ohio.

H. H. SPIERS, M.D.

PREFACE TO FIFTH EDITION.

Seventeen years ago the law of tuberculosis was given the Portage County Medical Society, at Ravenna, Ohio. In December, 1890, it was presented to the profession at large through the Cleveland Medical Gazette. During this period of fifteen or seventeen years, the writer has constantly been before the medical public, upward of one hundred and twenty articles have been issued from his pen, in current medical literature. To-day, as never before, the causation and prevention of tuberculosis is clearly recognized.

In this fifth edition of tuberculosis the writer endeavors to present more clearly the manifest workings of law. In this attempt the generous patronage of an unbiased profession is asked.

H. H. SPIERS, M.D.

Oberlin, Ohio, January 1, 1906.

PRELIMINARY STATEMENT.

As my view of the origin of tuberculosis is at variance with established teaching, perhaps a simple statement of belief is necessary.

1. Tuberculosis is a constitutional disease, dependent largely on the evils of civilization, and governed by the following law: The death rate from tuberculosis is in direct ratio to suspension of atmospheric influence.

2. The suspension or abeyance of atmospheric influence may take place from within or from without. From without through impure or impoverished atmosphere; from within through defective lung tissue, original or acquired.

3. Abeyance of atmospheric influence, in whatever way induced, causes a depraved tissue or dyscrasia, through which the tubercle bacilli enter and grow.

4. The growth of tubercle bacilli, being dependent on the precendent state or condition of the individual, is never *per se* the primary causes of tuberculosis.

5. Tuberculosis may exist, though infrequent, in the absence of tubercle bacilli, but can never exist without the precedent state or condition.

6. The plant growth, being a secondary condition or modifying influence in this most fatal disease, treatment directed against this growth must ever remain barren of permanent curative results and dangerous to the patient.

7. The precedent or primary condition being subject to law, and under control, tuberculosis is under control.

MEDICAL THEORIES.

When a small boy there came to my hands a pamphlet which stated the earth is flat, like a table, and rests on four huge elephants; each elephant stands on four tortoises.

Child-like I ask mother, what do the tortoises stand on?

To me the theory was highly significant, but to be complete it required a little earth filling.

Many theories of the past have been shown to rest on equally unstable bases. Many theories of the present, I apprehend, will be shown equally illusory.

Many questions will be asked in the same child-like simplicity, and many learned disquisitions will be given to prove that which never did exist. Such is life, and such is the history of all human progress, with its periods of pertinacity and vacillation alternately shown. Would you then discard all theory? By no means. Theory answers a great purpose in the world's advancement on scientific lines.

Our theories are in one sense our ideals. We search for and endeavor to establish that which we really believe to be true. Thus far theory is laudatory. But it is evident a theory must be based on something more than pure imagination.

Is the earth flat like a table, etc.? Would it not be better to take established truth as a ground-work, and build on this?

But where can established truth be found?

In medicine, in theology and in law we are constantly in search of it.

Oft-times truth lies close beside us and we see it not.

To-day the great medical telescope is located in Germany. Multitudes of people flock to hear its revelations.

[illegible] is seen

[illegible]

[illegible] detecting, cap-
[illegible] undertak-

[illegible] and the
[illegible] the same

[illegible] is in session
[illegible] curious thing is:
[illegible] not. *No microbes*
[illegible]
[illegible] been found that will
[illegible] causing the death
[illegible]
[illegible] that in tuberculosis
[illegible] at the seat of lesion.
[illegible] for it is found in no
[illegible] present is universally
[illegible] seen in colonies, in dis-
[illegible] observers. Seeing is believ-
[illegible] contemporary. That
[illegible] disease named has been re-
[illegible]
[illegible] has been how to rid the sys-
[illegible]
[illegible] has been already shown.
[illegible] modified by the presence of
[illegible] be no serious doubt.
[illegible] casual action in producing
[illegible] pure speculation.
[illegible] presumably the planet Mars is
[illegible]
[illegible] its people are not well up in
[illegible] have telescopes?
[illegible] Mars engaged in the study of as-
[illegible] his telescope he views the surface of

the earth and sees a flock of crows hovering near the carcass of a sheep. What are these crows doing? Day by day he watches them closely. They are eating the sheep. At once he concludes that the sheep are being killed by the crows. A book is written. This is standard authority in Mars.

But one observer sees a dead sheep on which there are no crows. Again he looks and decries another. He publishes his observations and asserts that sheep die from other causes than crows. Is not the conclusion a valid one?

Again and again observers have found bacilli in the sputum and lung tissue of phthisis pulmonalis. Observations to this effect have been published from time to time. The microbe is charged with causing the disease. This is standard authority. But one observer finds a case of phthisis pulmonalis in which no bacilli can be found in the sputum or lung tissue. He publishes the results of his observations and I assert that people die of phthisis pulmonalis, in which the bacilli do not enter as a factor.

Is not the conclusion a valid one?

A new observatory is now erected on the planet Mars. Its telescope is of the finest make and highest power. The observer brings his instrument to bear on the planet earth, and sees not only dead sheep and live crows in abundance but also multitudes of little birds which he calls sparrows. He watches these little birds closely. They are engaged in a contest with the crows. They fight fiercely. At length the sparrows are victorious and the crows are driven from the field.

The astronomer concludes his writings by saying that in order to prevent the death of sheep on the earth it is only necessary to increase the number of sparrows. A few timidly object to this teaching, but it is standard authority in Mars. Sparrows are now plentiful, but sheep still die. Something wrong.

A new scheme is now devised to clear the earth of its dread visitant, phthisis pulmonalis. It has the sanction of high medical authority. Phthisis pulmonalis is caused by

tubercle bacilli. Two methods are open to rid the system of these microbes: the direct and the indirect, analogous to our dealings with the Indians in the past. Direct, to kill him; indirect, to take him from his feeding ground. In either event the microbe or Indian must die. A few timidly object, but this is standard authority. Tuberculin is plentiful, but mankind still die of phthisis. Something wrong.

Science, though slow, makes progress even in Mars. A painstaking observer has been watching a sheep for many months. He has seen the animal die. Crows could not have killed him, for none are in that neighborhood. A brother astronomer examines the sheep and says he finds [illegible] in the earth near by—probably crow-tracks. The crows killed the sheep, but were driven away by the [illegible] of the crows *some other cause*. Science in Mars.

Likewise in earth science is progressive. A painstaking observer has been watching a case of phthisis pulmonalis for many months. No bacilli are found in the sputa, though many examinations for the same have been made. The patient dies. No bacilli are found in the lung tissue. A [illegible] examines the body and finds tubercular [illegible] in the lungs. The bacilli caused the patient's death, but were either driven away or *fled from some other cause*. Science in the earth.

The second observer in Mars reasons thus: Sheep die from various causes. Crows *alone* do not kill sheep. Crows simply eat the flesh of sheep after they are dead. *It is the condition of the sheep that allows the crows to begin work.*

The second observer in the earth reasons thus: Man dies from many various causes. Tubercle bacilli *alone* do not kill him. Tubercle bacilli simply enter the tissue as a feeding ground. *It is the condition of the system that allows the bacilli to enter.*

LAW IN TUBERCULOSIS.

In mathematics whenever a regularity can be traced, the general proposition expressing that regularity is called a law. For many years I have been led to believe that tuberculosis is obeying certain fixed law, as planets obey law in revolving around a central sun. To the general observer this statement may seem chimerical.

Zone.	Ventilation.	Death Rate.	Ratio.
Frigid .....0.....	Perfect	0.....Zero	1
Torrid .....5...	Less perfect	5.....Small	1
Temperate..10..	Least perfect	10.....Great	1

The ratio between ventilation and death rate is always constant.

Tuberculosis obeying law? Apparently no order in appearance or disappearance. No regularity in mode or extent of visitation. Coming and going like the wind, or a bird of the air—all is chaos, discord and confusion. So thought the ancients of the worlds about us. But soon law is discovered; order is evolved; a system is formed and it is found that not only do the planets move, but in regular orbits and with matchless precision. Stand by the seaside and watch the incoming and outgoing tide. Note with accuracy the flood and ebb of waters. Without previous knowledge you could assuredly say these waters move in obedience to law. A law now fairly well understood—the law of gravitation.

Stand by the bedside and observe the death rate from tuberculosis. Note the accuracy the figures tally year by year: Frigid zone, o; Torrid zone, small; Temperate zone, great. Without previous knowledge you could assuredly say these factors are essentials to the formation of law. On these essentials is based the law of tuberculosis. Extend your observations to the coast line of a continent. Mark the varied difference in tidal wave in the various latitudes. Truly, you could say this law is not equally potent at all places—but observe it is, nevertheless, the same law, and the difference in height of tidal wave is due to the coast

line of the continent. Extend your research to prevalence of tuberculosis in the cities of the world. Mark the varied difference in places of the same latitude. Truly, you could say here is absence of law. But observe the same law prevails, and the difference of prevalence is due to abeyance of atmospheric influence.

I herewith give, from standard authors, the maximum of tide for the places named:

Bay of Fundy	75 ft.
Boston	10 ft.
Straits of Magellan	50 ft.
Florida Reefs	2 ft.
Head of Persian Gulf	36 ft.
Mid-ocean	2 to 3 ft.

I herewith append, from W. Halle, a partial table showing the prevalence of tuberculosis per ten thousand, 1889 to 1890, for cities named:

Brunn	76.7
Baltimore	24.9
St. Petersburg	48.8
London	18.4
Vienna	54.4
Rome	22.5

As the difference in height of tide along the sea coast does not invalidate the law of gravitation, neither does the difference in per cent of tuberculosis in the various cities invalidate the law of tuberculosis.

In truth, the law in both cases is verified by the apparent contradiction.

In dealing with the problem of the tides we find it complex and difficult. Equally complex and difficult is the problem of tuberculosis. If the tide and tuberculosis be [illegible] law, they should alike be susceptible of demonstration, and barring preconceived opinions, should alike [illegible] of evidence.

As already stated, the death rate is modified by abeyance of atmospheric influence. The stabled cow, the penned sheep, the tame rabbit, the caged monkey, lion, tiger or elephant almost invariably die of tuberculosis. Sel-

dom, or never, do these animals die of this disease if living in the open air. The disease prevails much more among those whose vocations are sedentary than among those whose occupations are out of doors. The mortality in prisons has been shown to be four times as great as outside. The death rate from phthisis is estimated at fifteen per cent of the total mortality, while in prisons it is from forty to fifty per cent.

Primary tubercular lesions are, in a majority of cases, connected with the respiratory organs.

"There is nothing essentially destructive or necessarily fatal in tuberculosis. That in all stages it may be checked and enable the person affected to live many years, and die subsequently of old age or other disorders."

The Rev. Josiah Strong, author of "Our Country," said in my presence, a number of years ago, words like these: "When a young man I was declared consumptive. Sentence of death was pronounced by able physicians, east and west. I took no medicine; ate plain food and lived wholly in the open air. To-day I am the picture of health."

Dr. Joseph Parish, of Philadelphia, gives a similar experience.

Many, no doubt, can recall cases that have a like bearing. It is, therefore, seen a constant ratio exists between ventilation and death rate. As the ventilation becomes poor the death rate increases and vice versa. The law then, as laid down in October, 1890, is simplified thus: The ratio between ventilation and death rate is always constant. In order to present this more clearly to the intellect, through the eye, I have arranged the following table:

Zone.	Ventilation.	Death Rate.	Ratio.
Frigid.....	0..... Perfect	0.....Zero	1
Torrid.....	5...Less perfect	5.....Small	1
Temperate..	10.. Least perfect	10.....Great	1

If, then, a regularity be traced, what shall we say of law? According to the definition, law must exist.

But it has been said that confinement, with insufficient ventilation, means the presence of the bacillus. Observe

this. Exposure to atmosphere breathed by consumptives is not attended with danger so long as good ventilation is maintained. Observe this: Ill ventilation, whether in the private room or crowded tenement, invariably increases the death rate. Good ventilation, then, insures immunity. Ill ventilation insures death. Can this much be said of the absence or presence of the bacillus? Is tuberculosis caused by the bacillus? Before the world today it stands not proven.

Look upon that field, with its depression in the center. The rains of heaven fall upon that field. The depression is filled with water and it becomes a shallow lake. Rushes, reeds and grasses, peculiar to low places, begin to grow in that lake. Did the rushes, reeds and grasses cause the depression? Did the rushes, reeds and grasses cause the lake? Drain the lake, the rushes, reeds and grasses disappear. But, says the objector, can we not take these rushes, reeds and grasses and make them grow on the arid mountains? Yes, we can; but how great the labor and how small the result.

Yes, we can; *but nature does not work that way.*

Look upon that man as he walks the streets. A bad family history, a prolonged illness—the depression in that field. Grinding poverty or pampered luxury has been his lot—the rains of heaven. Bacilli begin to grow in his lungs, are found in his sputum—the rushes, reeds and grasses. Did bacilli cause that man's history or illness? Did bacilli cause poverty or luxury? Take away the conditions, the bacilli disappear. But, says the objector, can we not inject bacilli, or a pure culture, into the healthy tissue and cause the disease? Yes, we can; but how great the labor and how small the result.

Yes, we can; *but nature does not work that way.*

Tuberculosis caused by the bacillus? Tuberculosis is transgression of natural law. Violation of law brings its penalty; observation of law its reward. Standing near a spot sacred to every true American, I declare tuberculosis can be controlled. Not by the injection of chemicals, not by the injection of tuberculin, but by the observation of law.

MARRIAGE.

Should an attempt be made to analyze the cause of marriage one would inquire into the nature of the desire implanted in the human breast. No attempt is made other than to express a judgment that it is largely social. In the beginning it was said: "It is not good that man should be alone." In this later day one portion of scripture seems to be tacitly acknowledged.

Whatever the incentive that leads to marriage, whether love, impulse or ambition, in the eyes of the law united they are. The incentive *per se* may be of little import, but the union is the weal or woe of two lives and succeeding generations. Generally speaking, the incentive is of great import.

Two of opposite sex meet in a car or at a party and are enraptured one with the other—a mutual liking. In what it consists even the participants can not explain, but it leads to marriage.

One party sees another to whom he or she is attracted with an unwonted impulse. Every opportunity is sought for an introduction. The acquaintance leads to a wooing, which ends sometimes in an unrequited love, but more often in marriage.

Another desire to rise in the social or financial scale—a very laudable ambition. Who does not, if honestly attained? The hand and heart are sought wholly for this purpose, under the guise of a fervent love—and ends in marriage.

There are also those of a sordid nature whose whole being is wrought up with having a good time. Matrimony has joys untasted. To these joys they are allured and seek kindred natures in marriage.

Some seek wedlock as an oasis in the desert of life.

It is a constant theme of conversation; little else is thought of. Any one of the opposite sex is accepted readily. These subjects marry early in life.

Some look on wedlock as a snare into which the unwary are entrapped. The subject is frequently referred to, but discernment is necessary in selection. These parties are hypercritical, and marry late in life, if at all.

Again, we have the intellectual devotee, whose questions, imaginary and otherwise, would deny the most ardent lovers—who, in truth, settle marital questions as do the majority of people.

Then there is the philosopher, who looks on wit, beauty and wealth as the mere accident or incident of fortune—the externals of life. Theoretically, these people have no choice except in health and a moral nature. Practically, the number who thus marry is very small.

On examination, it is seen that in marriage, as in other things, all have a motive. Whatever the motive, the result attained is the home, the foundation and true secret of all organized society. On the purity of the motive hinges the secret of connubial happiness. Let those who contemplate wedlock and desire happiness study carefully this phase of the question. It will amply repay them.

But marriage is something more than the union of two parties for life; it is the offspring—it is *to give to that offspring a vigorous life.*

Many a man or woman is deterred from marriage from fearing its burdens and responsibilities, largely how shall we feed, clothe and educate those granted us; but how few ask the greater question, how shall we best transmit health and long life to our children? A vigorous constitution—a fortune in itself—readily secures the great objects of life. Physical weakness, however great the fortune, is doomed to doubtful victory or defeat.

How much wiser the parent who transmits health than wealth! How much wiser the state that frames laws to secure healthy citizens than the one which legislates to amass individual wealth! How little regarded by legislators!

Marriage is union—the joining of two segments, each incomplete in itself. Children are the fruit of this union.

It is as consonant with reason to say that parents beget children after their kind as trees yield fruit after their kind. Observation shows it equally true. Still further, not only are the mental and physical excellencies or defects transmitted, but also *the virtues or vices are transmitted in excellence or defect.* Let us endeavor to illustrate transmitted defect by a few familiar examples.

A married couple start in life with good health as a fortune. By arduous toil a small tract of land is bought and a house erected. Another small tract is added. Still another, and so on, until five or six hundred acres are bought and paid for. Their life has been alone. No Sabbath, no company, no holiday, no rest—continual toil early and late. I said alone—not so. Eight children have been added to the family. *All are in poor health.* The parents have been so engrossed in securing a competence as to forget a law of their being.

Work—so commendable in all—carried to an extreme proves a vice. This vice is transmitted in physical weakness. The children must ever suffer the sin of their parents. We see this law illustrated in the wage-earner's family. Arduous toil, long hours, low wages, high rent, meager diet, etc., are some of the ways in which labor is degraded and physical vigor in parent and child emasculated. Legislation in behalf of those thus down-trodden is demanded. It would be beneficial to the human race.

Not alone in this regard is manual labor. Intellectual work is subject to the same law and grievance. Many a brain worker in the race of life has fallen by the wayside, or in an attempt to live or secure a competence has transmitted feebleness to his offspring. One instance of intellect and application is recalled, *who buried twelve children under two years of age.*

This law is illustrated in the drink habit of to-day. How often we see the imbecile, the idiot and the deformed in the family of the confirmed drunkard! Who can say

these children are not equally deformed in their moral nature? They certainly are. How readily we condone an obliquity in a child when we know the weakness of the parents! In these and kindred cases law can accomplish much, but I am satisfied education can do more. Not until mankind clearly apprehend the law of their being will they be enabled to rise above a common level, even with the aid of human statute. How inefficient the best of statutes without an enlightened public sentiment! Thus must it ever be, "line upon line and precept upon precept." Education precursory of true liberty.

Dipsomania is not alone in its work of deterioration. It is but one in a series—though perhaps the greatest that is leading us down. Tobacco, opium, chloral, etc., have their votaries and claim their victims. Vicious habit is hydra-headed, and requires the actual cautery of education and law. Future generations demand it as their life.

Rapid child-bearing is confirmatory of this law. In all great efforts of nature periods of rest are required. It is seen in the field and forest. In frequent births the mother's rest is short or *nil,* her vital force is reduced, and the children suffer from lack of nourishment intra and extra-uterine. This is seldom seen in the typical American home. More often is seen the pale face and wasted form of the mother striving to rear an only child in luxury that she may be a devotee of fashion. This much is open. Withdraw the curtain—too often is seen a *tri-annual abortion.*

Among the privileged few is sometimes seen the family physician. To whom shall we attach the blame? To the frail mother? In the writer's judgment, nine-tenths of all abortions are procured at the instigation or request of the father. To whom the blame? To all concerned. Does such action affect a future offspring? Yes—mentally and physically—and that in a deleterious way. *It is crime in the sight of God and man.*

Sickness in either parent causes feeble offspring. A father who begets children during a convalescence or illness entails weakness in those children. A mother seri-

ously ill during gestation either aborts or the child shows an infirmity. Of course, there are exceptions, but the rule may be laid down as established, *that no party should become a parent whose health is seriously impaired.*

Age in one or both parents modifies the offspring. The parents, not having reached maturity, it is often seen that the first or second child is feeble and subsequent children are strong. With the mother nature has her limitation. Not so with the father. In marriages where there is disparity of years, care should be exercised. How often we see the old man marry the young woman! Are the children vigorous? That depends. Some men are young at seventy, while others are old at forty. Age alone should be no bar to offspring.

To recapitulate, vice transmits defect:

Vice in Parents. { Overwork, mental or physical. { Choice. { To secure a competence. / Necessity. { To obtain a living. } } / Excess or vicious habit. { Drink habit and others. / Rapid child bearing, abortion, etc. } / Sickness. / Age. } } Feeble Offspring.

The question may be asked, are the male and female equals in marriage? In accountability to God and man, in the relations of life one to the other, they are equal partners. In the transmission of excellence, defect, similarity, etc., they may be equal partners, but at times there must be inequality. In the early months of pregnancy the child is subjected to maternal impressions. During gestation and nursing the fetus or infant is living on pabulum distinctly the mother's. One would naturally infer the disposition and dyscrasia of the child to be largely of the mother. Is the inference the observation? An intelligent mother says: "When *enccinte* I longingly desired to attend dances. My husband thought it not best and refused to go. My

only child from his boyhood until now has *a mania for dancing.*" Another equally intelligent says: "I am ashamed of my daughter's actions, yet I am pleased she is trying to do better, for I know it is *all my own fault.* She acts just as I did in the early months of gestation."

There *is* an inequality. At conception the father indelibly stamps an impress, and the being passes from his control. His work is done. Not so the mother. In gestation the blood of the mother is the life of the child. So also in nursing. If the blood be impoverished the life of the little one is endangered. Abortion commonly occurs. The mother having a constitutional diathesis, the father being in health, the diathesis is more certainly transmitted. Reverse the conditions: the diathesis is less certainly transmitted. The mother then has a greater power of transmission than the father. This can be clearly shown only in a limited number of diseases. Maternal heredity is stronger than paternal heredity in syphilis. The family tree in tuberculosis inclines heavily toward the mother. The fetus *in utero* may be attacked with smallpox provided the mother is the subject of the disease. It is seen that while maternal impressions *may affect all children* it can only be *presumed* that maternal exceeds paternal heredity in all disease. Yet the presumption must ever be a strong one.

Heredity is more or less a factor in gout, diabetes, mellitus and insipidus. The males having the disease are in preponderance to the females. This inequality does not show the male more readily transmits the disease named, but that he is more subject to them. In fact, it rather shows the female the greater in transmission and the lesser in subjection. In that remarkable disease, hemophilia, this principle is still more strong. The mother transmits but does not inherit the tendency to hemorrhage, or, as a Darwin might put it, the mother is a higher type of development. To formulate:

1. The maternal impressions influence offspring.

2. In all so-called constitutional or specific infectious diseases a transmission, if shown, is largely of the female.

From the above we would deduce: A race or stock is most surely improved by selection of mothers.

I have dwelt somewhat at length on the incentive to marriage. Perhaps not wisely. In every community there are some who have great faith in human statute. If there be a beneficent change in any regard it must be by law. My view accords more to education. In a democracy, enlightenment must precede statute. It is with this endeavor the apparently little incentive is shown. If one's inclination to a partner runs in a pretty face, amiability, wealth, etc., how absurd to so legislate as to restrict him to poverty in feature, disposition and fortune!

But if it be clearly shown that certain actions invariably produce certain results; that a life of temperance and virtue is excellent and transmits excellence; that a life of debauchery and vice is defect and transmits defect, how clear it must appear to every well-thinking man and woman that there is but one way to ennoble and elevate mankind: *To practice virtue and shun vice.* Virtue is the observance of law, vice the violation of law—the law of our being. Let us shun vice and cling to virtue in marriage.

HEREDITY.

John Milton, in "Paradise Lost," speaks of our first parents as "the loveliest pair that ever since in love's embraces met." Milton is given to imagery, but who can think of a being more perfect than one fresh from the Creator's hand, unsullied by environment, untarnished by sin? To me the creation should not only be lovely, but perfect in every particular.

Looking back through the ages, I do not see Mother Eve with husky voice or disturbed respiration; neither do I see Father Adam with bacilli or tubercular nodules in the lungs. To me the conception is a perfect creation—perfect in form and health.

We are told our parents fell from this estate. The exact nature of the sin will ever puzzle theologians, but this much is certain: Adam and Eve violated law. "Of man's *first* disobedience and the fruit of that forbidden tree whose mortal taste brought death into the world and all our woe with loss of Eden."

Then, as now, violation of law brings its penalty, observation of law its reward.

Evidently, the Adam of to-day is not the Adam of creation.

Had we a complete account of disease since creation—embracing not only literature but observation—I firmly believe the record would show no tuberculosis in the early centuries.

All animate creation living wholly in the open air are free from tuberculosis. Our ancestors were nomads—wandering from place to place in search of game or pasture, sleeping under nature's canopy—life akin to animate creation. The disease, in the early centuries, must then have been unknown, for we have no evidence that nature's laws have in any way been modified or changed.

If, then, no tuberculosis lurked in the tissues of our first parents, if the disease did not exist in the early centuries, how does it appear that one-seventh of the present mortality is due to its inroads? A frank question, and it should receive a candid answer.

Tracing the genealogy of the patriarchs from Adam to Noah, we find a longevity unparalleled in the history of mankind. During this period two things stand out in bold relief—outdoor life and length of days. These great object lessons may receive various interpretations. To me only one appears satisfactory: Outdoor life—a sequel to creation; longevity—a sequel of outdoor life. Interpret them as you may, length of days and outdoor life ever appear together.

But it may be asked, is not immorality also associated? Yes, it is—a depravity of mankind, but not a depravity of the patriarchs.

An exuberance of animal spirits—with lack of self-restraint with the multitude—a consistent life of the few.

We read of the general wickedness, of one hundred and twenty years given for repentance, of the flood, with the destruction of mankind. We also read "Enoch walked with God," "Noah was a just man and perfect in his generations."

A question now arises: Does heredity modify the average life? In other words, does it make aught of difference to your grandchildren or mine what our lives have been, so far as heredity is concerned? I verily believe it does; that this has been true in all ages and in manifold ways. In primitive times the workings of a law on this line can be readily seen, but not as readily detected in the present generation. Methuselah, the oldest man of antediluvian days, was the son of Enoch, who walked with God. Shem, aside from his father the oldest man of postdiluvian days, was the son of Noah, the perfect man of God.

If we carefully examine, I think history will show that not only do we inherit and transmit estates financial, but intellectual, moral and physical as well. In Enoch and

Noah we see illustrated a law of retribution. The children inherit, the parents transmit, a tendency to virtue, plus length of days.

To formulate our view: A father shortens or extends his days by vice or virtue. He transmits to his progeny a tendency to vice or virtue, minus or plus length of days. The same may be said of the mother. One parent being vicious and one virtuous, gives parents and children an equal footing in the race of life. Both parents being vicious or virtuous, makes the law doubly sure. It follows as the world becomes virtuous, longevity is increased, and vice versa. Of course, we are speaking only of the law of heredity or physical descent.

We hold, then, as in a vase, the treasures given us. We add or take from as virtue or vice governs us. We transmit—how often less than we receive!

By heredity is meant prenatal inheritance, that which one receives prior to birth. Tuberculosis is used in its most comprehensive sense. Heredity in tuberculosis, then, means prenatal inheritance of an intractable disease.

In all ages heredity has been recognized. This child looks like his father, that child resembles her mother. Physical resemblance to the biographer is heredity to the biologist.

Physical resemblance is not alone, a mentality is transmitted. How often we see a family of children with mental traits or characteristics of their parents! Yet this does not always pertain.

Perhaps no better illustration can be given than in the world-renowned Beecher family. Edward, the scholar; Harriet, the writer; Henry Ward, the orator—children of the eminent divine. A clear case of heredity in mentality. Yet to-day not one representative of that great family stands an equal in intellect to any of the four named.

This brings us to a truth which I wish to indelibly impress on the mind of every one. That while physical resemblance and mental characteristic is transmitted, it is not transmitted, so to speak, in one continuous stream, as with

the river; there are water-falls and rapids and meanderings so in heredity.

Let none claim that because heredity is not shown to be continuous it is no longer heredity. Heredity flows in no such perfect channel. On the principle of deviation in heredity and selection of offspring, Darwin has the great hold on the scientific mind. On this principle of deviation and selection the florist or stockman select the prettiest or best and make advances along this line. So in the thousand and one things we see around us. Ever since man's thoughts have been reduced to writing, perhaps before, certain diseases have been regarded transmissible from parent to child. Cancer, consumption and insanity belong to this class.

Here is a field for the logician. If a healthy mentality be transmitted, why not a diseased mentality? If facial expression, why not other physical condition? If tuberculosis be a constitutional disease—and we believe it is—why not transmit the constitutional dyscrasia?

Thus, to the logician arguing from probability, constitutional disease IS transmitted. Careful observation confirms this probability. Insanity has been traced through successive generations in many families. Cancer sometimes shows itself in the offspring of the first generation, but more often in the second.

Children of consumptives, though the environment be changed at birth, die of this disease among other healthy children, born of other parents.

We have already shown heredity travels in no perfect channel. It is therefore seen that the proof of heredity is complete.

But, say some, tuberculosis is not a constitutional disease. It is a germ disease. The writer thinks differently, but for the sake of meeting on a common ground we assume you are right.

The microscope makes many revelations. By its means scrofulosis and tuberculosis are declared one and the same. This has been verified in Germany. We accept it. Scrofu-

losis is modified by transmission, not so in tuberculosis. Thus it is seen, if the latter statement be true, the diseases which are declared one and the same are not one and the same. If one and the same they would alike be modified by heredity.

Let me illustrate: My friend and I are walking in the country. I exclaim, "What a lovely white house!" "Yes," says my friend, "but that house is also black." You don't mean that same house is both black and white at one and the same time? That is just what I mean. Well, I fail to see it. My friend replies: "Were you ever in Germany?" "No, sir, I never crossed the North Atlantic." Well, that explains it.

Ladies and gentlemen, are you satisfied with the explanation? Would it not be wiser to call things one and the same that agree in every particular?

If these diseases be one and the same, heredity in tuberculosis is rendered stronger than probable.

Let us take another step. For many years it was a moot question whether living bacilli could be transmitted. It is now universally agreed they may be carried by the circulation to various parts of the body and through the fetal circulation to the fetus itself. Ardent bacteriologists exclaim: "Why look for heredity? Here are seeds of disease carried to the prenatal offspring."

Please reflect one moment. Did it ever occur to you that before a plant can take root there must be a suitable soil or condition of growth? Which takes priority, the plant or the soil in which it grows? Answer that question honestly and you condemn yourself.

The moment you admit a growing bacillus at birth, that moment you tacitly admit heredity in tuberculosis. Heredity in tuberculosis is all we claim.

We must not stop here. Imagine before you five ladies who gives instruction in painting on canvas. Your daughter wishes to acquire the art. Before selecting an instructor, suppose you put a test question to each of these teachers. You hold a fabric in your hand and ask severally the color.

Listen to the answers: Red, blue, orange, violet, indigo. What arises in your mind? One of two things—either these ladies are deceiving you, which is improbable, or else they do not understand the business they profess. What painter could instruct in blending three to five hundred shades of color who could not distinguish a primary one?

You have a son to send to college. You call before you five leading clinicians in the state and put to each the test question: What factor is heredity in tuberculosis? Listen to the answers: Nothing, little, much, a great deal, all. What arises in your mind? One of two things—either these teachers are deceiving you, which is improbable, or else they do not understand the business they profess.

Who can instruct except they who know?

Ladies and gentlemen, have we been teaching error in the past? Come, let us acknowledge our fault, or rise in our place and refute what is said.

We have not reached the pinnacle as yet. There is another step. With heredity in tuberculosis declared and demonstrated, an herculean work must be wrought.

In marriage something more than minister or justice is required. It needs:

1. General enlightenment in order to select.
2. A physician's certificate by both parties prior to the marriage contract.
3. A secretary of forensic medicine, with a universal marriage law.

Ladies and gentlemen of the profession, when we rise to the occasion and demand these, they will be granted.

THE PRECEDENT STATE.

When Robert Koch announced the discovery of the tubercle bacillus, its invariable association with tuberculosis and its consequent causative influence, the medical world were ready to accept anything as a working theory. Tuberculosis had hitherto been an intractable disease. It was argued that when we have greater light or insight into the cause or causes of the disease, then we will be more successful in treatment.

Some few physicians had anticipated the discovery. Others could see no reasonable objection to the conclusion. Figuratively speaking, the entire medical profession took off their hats and hurrahed.

Had Koch discovered the same germ in health, determined its invariable association and declared the presence of the germ the consequent cause of health, he perhaps would not have awakened the enthusiasm, but the truth uttered would have been equally clear.

Tubercle bacilli are ubiquitous; are found in both health and disease. Growing bacilli are found only in disease. A soil must precede the growing plant. Hence, growing bacilli imply *a precedent state.*

What causes the precedent state? The error of Koch is a common one. Birds are seen on the growing plants. They are the supposed cause of failure in certain crops. The birds are killed. It is then found the birds were eating the enemies of the growing grain. Tubercle bacilli are looked upon as the enemies of human kind. The profession have been largely engaged in their destruction in toto. To the writer it seems, should the extermination prove successful, tuberculosis would still exist.

One thing should be plain to every observer: Health and the tubercle bacillus do not constitute disease. Something more is required, viz., the precedent state.

What is the precedent state? It is the condition of the individual that allows or encourages the growth of tubercle bacilli in his system. The tubercle bacilli are present in the bodies of every animate creature. They may be in the saliva, the blood, the tissue, etc.

If the person be in health, or in other words, if there be no precedent state, these germs remain, or come and go, and cause no systematic disturbance whatever.

Should the person inherit or should he acquire the precedent state the living tubercle bacilli at once take root and flourish, for the temperature of the body is favorable to their development and growth. When these germs are found growing in the human body the person is said to have tuberculosis. Should one receive or acquire the condition favorable to the growth of these germs, this person may be said to have the precedent state.

What is the precedent state? Incipient tuberculosis—tuberculosis in the absence of tubercle bacilli. As elsewhere stated, tuberculosis may exist, though infrequent, in the absence of tubercle bacilli, but can never exist without the precedent state.

In how many ways is the precedent state commonly received? In two ways—heredity and abeyance of atmospheric influence.

Please explain in what way one inherits the precedent state? The precedent state is most commonly inherited through a tuberculosis ancestry. The same state may also be inherited if one or both parents at conception, or the mother during gestation, be suffering from suspension of atmospheric influence, either from causes original or acquired. This, to some, may seem strange, but must of necessity be true. It is simply the violation of law on the part of the parents the precedent state transmitted to the children.

To secure a healthy offspring it is shown to be just as necessary to live right as to marry right. A premium is therefore placed upon correct living and the taking of proper persons in marriage. To render this plain, let me

illustrate: A mother or father has tuberculosis at conception. Perhaps it is both parents who are afflicted with the disease. The children born die of tuberculosis. This seems plain.

In the above, instead of tuberculosis, place the precedent state. The sentence then reads: One or both parents have the precedent state at conception. What would one reasonably expect as to offspring? They would likewise have the precedent state. With children thus born, how easy to explain results.

Many obscure cases are rendered clear by this explanation. We cite one by Austin Flint, Sr. ("Practice of Medicine," 1873):

"Dr. Henry E. Paine, of Dixon, Ill., illustrates a congenital tendency without the evidence of inheritance. Mr. S. is fifty-seven years of age in good health. His wife is fifty-two and well. No progenitors have been known to die of tuberculosis. All the children, five in number, died with this disease between 1853 and 1861; their ages respectively being at the time of death twenty-three, twenty-five, twenty-four, twenty-two and twenty-three."

In the absence of knowledge as to the occupation, mode of living, previous history of disease, etc., of Mr. and Mrs. S., the writer has the right to assume:

1. Mr. or Mrs. S., one or both, had pneumonia prior to marriage. In common parlance, they were well, but each had a bronchial difficulty, or perhaps an hepatized lung. To what does this condition tend? Suspension of atmospheric influence—the precedent state.

2. Mr. or Mrs. S., perhaps both, were engaged in an unhealthy occupation. Mr. S. in a tow-mill or grinding on an emery wheel ten hours per day, constantly spitting black dust from his lungs. Mrs. S. making shirts in close quarters fourteen hours per day. In either case to what would this induce? Suspension of atmospheric influence—the precedent state.

3. Their manner of living was unsanitary. Mr. S. was a miser. He lived in one room and kept the door shut

to save fuel. Mrs. S. was a crank and afraid of night air. She put the children to bed and covered their mouths to keep out the cold or heat. To what would this condition of things tend? Suspension of atmospheric influence—the precedent state.

Under these circumstances the parents were well or in good health, but their progeny received the precedent state just as truly as though both parents were suffering from tuberculosis. Result—the children died of tuberculosis.

The result would have been the same had the parents lived in our generation. They might have indulged in present scientific fads—the injection of tuberculine to cause sloughing of disease tissue; the placing of sterilized gauze over all apertures for ventilation to prevent the entrance of microbes, so fatal to children; or, were they familiar with present ideas in the fatherland, the securing of artificial immunity. The writer believes that under any or all of these so-called cures or preventives the children would have died as they did, of tuberculosis.

It is not cure, but prevention, that will ultimately control the disease—prevention, not by injection, but by *controlling the precedent state.*

But hold!!! Why not assume Mr. S. had a right inguinal hernia or Mrs. S. scarletina in infancy? The reason is obvious. Nothing is assumed that does not naturally lead to the precedent state.

Does it necessarily follow that one having the precedent state must die of tuberculosis? It does not necessarily follow. It must be remembered the precedent state is *the first link in a great chain.* If there be no first link *the chain will never be formed.* If the first link be present, others are readily added. In a typical case will other links be joined? That depends. For the individual it must ever be a constant battle.

Let us endeavor to make this clear. Mr. A. has the precedent state. The soil in his system is ready for the seed. The tubercle bacillus, the seed, is constantly present. What is the probability? The seed will at once take root.

How best to proceed? There are three methods:

1. To get away from the germ.

2. To get away with the germ.

3. To leave the germ alone or rid one's self of the precedent state. To use terms more consonant with science: (1) Germ exclusion; (2) germ destruction; (3) germ non-intervention.

1. Dr. W. Van der Hayden, a bacteriologist of Japan, has recently built a microbe-proof house. Its manner of structure, dimensions, etc., are known to many. We will not refer to these. Japan is young in science. Science in theory and science in practice are two things. Suppose the germs cause the disease; the house perfectly excludes the germs. It is evident the doctor cannot always remain in his house. He must be a live M. D. He must attend to business. Will he take the house with him constantly? He has a field to cultivate. Will he kindly loan the house to his servants while at work? He has a large manufactory in which thousands of hands are employed. Will he include this establishment in his microbe-proof house? If not, why not? The doctor will find theoretical science is not practical.

We now introduce another class. In this we have the intellect of our land. Says an authority: Whenever I see a case of incipient tuberculosis I exclaim: "Haste to the mountains." "Escape for thy life!" The writer asks why so great haste? To get away from the germs.

"Come, let us reason together." Suppose you stand before two bare rocks, the one on the right hand, the other on the left. On the one rock is placed one kernel of wheat. On the other rock is placed one thousand kernels of wheat. The conditions of growth, light, heat, moisture, etc., being the same, which would germinate the sooner, the one kernel or the one thousand kernels? The writer asks any man in the land to show a difference in germination. Why do you hasten your patients to the mountains? To escape from the germs of disease. *What is foolishness!*

Do not germs exist in the mountains? They are not so

plentiful in the mountains. If germs cause the disease, if the condition of the system be favorable to their growth, are not a few germs all that is necessary?

If absence from germs be all that is required, please be consistent. Why not lease Dr. Hayden's microbe-proof house? The truth lies here, the mountains do benefit, but the benefit does not consist in absence of germs. It consists in more perfect aeration of the blood. In other words the more perfect aeration drives away the precedent state and the germs do not grow. Let this be remembered.

To recapitulate: (a) Science has no practical method of germ exclusion; (b) had science such method it would be useless unless germs cause disease.

2. Germ destruction. It is true germs may be destroyed. There are germicides in abundance, and some of them very efficient ones. It is also true that science knows no method of total germ extinction. Had we such method it would be useless unless germs cause disease. The writer thinks the latter stands not proven in tuberculosis.

3. Germ non-intervention. This is the author's own method, and, he thinks, has the merit of being practical.

WHOM TO MARRY.

So long as medical men firmly believe the germ theory of tuberculosis, so long there will be no true progress in prevention and control of this disease.

So soon as we grasp the idea of a precedent state or condition in the individual prior to the advent of the bacillus, so soon we take the first step in prevention and control.

There can be no definite action until there is clear apprehension.

If one only cares to look he can readily see the tubercle bacilli do not grow in the normal or healthy tissue. It is always in the abnormal or unhealthy tissue they take root and flourish.

Tubercle bacilli, then, differ from the ordinary parasites that infest the animal and vegetable kingdoms.

Again, a recognition of heredity in tuberculosis—a perception that something is inherited other than an active bacillus—likewise leads to investigation that will enlighten and aid in controlling the disease. It is into a channel of this character we desire to enter at this time.

We have elsewhere stated, "Abeyance of atmospheric influence, in whatever way induced, causes a depraved tissue or dyscrasia, through which the tubercle bacilli enter and grow." In other words, a law underlies the formation or creation of the precedent state or condition.

In heredity the precedent state or condition of the offspring is received direct by parental transmission at conception, or more slowly, through the mother during intrauterine life.

At conception the father's work is complete. If the father at this time have a constitutional dyscrasia, or if he be violating a law of his being so as to impair his organism, the fetus will certainly show this dyscrasia or violation at

birth or in after years. The same may be said of the mother.

If both parents have this dyscrasia or are violating law, the result named to the fetus is doubly certain, or, perhaps better, doubly strong.

At conception the work of the mother is complete. During gestation, if the blood of the mother be impure or impoverished, it will certainly cause the death or deteriorate the health of the intra-uterine offspring. This statement is confirmed by every-day observation. It is therefore seen that the character of the offspring must be largely determined by the health of the mother.

If we are clearly understood, the precedent state or condition is found in two classes:

1. Those who in any way suspend atmospheric influence.

2. The fetus or intra-uterine offspring under the conditions named.

Or perhaps it is rendered clearer by saying the precedent state or condition is received in two ways:

1. Suspension of atmospheric influence.

2. Heredity.

While the law of formation or creation of the precedent state or condition may be active in the ancestry, it is necessarily inactive in the prenatal offspring, *per se;* hence a question now arises:

How do you reconcile a condition induced by law and the same condition induced by heredity in which this law is held in abeyance?

An illustration perhaps will render this clear. Along the ocean coast there are tides. These tides are governed by law. A prevailing wind increases or diminishes the tide at any point of the ocean shore. Heredity is a prevailing wind. Heredity may increase or diminish the death rate from tuberculosis.

Eliminate all disturbing elements and there would be uniformity in tide. Eliminate disturbing elements in tuberculosis, of which heredity is one, and there is uniformity of action in law. There is this difference: The tide may

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The garden returns
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mankind.
e. You select a partner. Whether
se or choice in the selection, she pleases you

and the union is joyous but for one thing—in a number of years, more or less, usually less, the wife dies of tuberculosis. Yet more—*the children have a history of tuberculosis.* Perhaps this is the record of a husband. The result to him is just the same; *not always so to the children.*

All observers agree that tuberculosis travels most readily through the mother. Why? Because it is the mother who sustains the fetus during gestation. A diseased condition of the mother is therefore more liable to be transmitted.

Father and mother are equals in conception, unequals in gestation.

As social custom gives man the province of selection, observation should teach him to select wisely. As social custom prescribes woman an acceptance or rejection, she should be taught to accept or reject wisely.

WHOM TO MARRY.

Let no man propose to a woman who has a clear family history of tuberculosis. Let no woman readily accept a man with a clear family history of tuberculosis.

While the woman, under certain conditions, as vocation, environment, etc., may accept a husband with a hereditary taint of tuberculosis, it is best for her not to do so. Under no circumstances should one secure a wife with a tubercular history. The progeny in the former case is generally free from the disease, but not always so; the progeny in the latter case are seldom or never free from the disease. Of course there are exceptions.

Intermarriage of tuberculous subjects should be prevented by legal enactment.

What more can we say? In prevention of tuberculosis education and restraint should be the watchword. In all theorizing, practical results should be the object or aim.

EDUCATION.

We must educate. We must educate. This has been the watchword in our country since its early history. A commendable watchword. Washington, Franklin, and others expressed the same in like words.

Some restrict education to the acquirement of knowledge. It is more than this. Education has for its object the development of the powers of man. This development may be along many lines of work. It truly includes original work. People must be educated even to think.

It does not follow, then, that he is best educated who has the most information in store; the largest library. Rather he is best educated who best reasons from cause to effect; who, while having the requisite knowledge to inquire, has also the ability to generalize.

We speak thus particularly, for many think education and acquisition of knowledge are synonymous. There is a distinction and ofttimes this distinction makes the difference in mankind.

On no topic do we more clearly require education than on the one before us. Our mental shelves are laden with acquisitions, but in the writer's judgment little education is present. False notions and ideas have become so blended and intermingled with actual knowledge that much is taught which lies in shadow-land, that cannot endure the test of time. Education should lift us through or above the shadows into the reality; open the veil before us to let the sunshine of truth enter. We must educate, but we must do so as to awaken latent thought, cultivate original research, and teach every man to think independently. Then education will be of value.

Today there is a germ theory of tuberculosis. Truly, it is a theory. Is it anything more? We think not. Med-

ical works are filled with disquisitions on the tubercle bacillus, the so-called cause of tuberculosis; when, where and how the germ is detected; its significance when found or when not found; the procedure, if latent or growing; the way to capture, isolate and cultivate; the best microscope to look at, after or into the invader, etc., etc., etc.

This is all very well so far as it goes, but it seems to the writer like superficial cultivation. We need occasionally a subsoiler that will strike deeper and bring up that below into the sunlight.

A number of years ago an enthusiastic agent was introducing a certain kind of honey bee. Among the many points of excellence of this particular bee was its size, hardiness and qualities as a honey collector; so large no other bee would quarrel with it; so hardy the climate had no effect upon it; so great a worker it did not require feeding. He dwelt on these points with a fervid oratory. A hive of peculiar construction was then introduced. It excelled every other in that the holes or exits were so small that no enemy of the bee tribe could enter. The hive was absolutely safe from all invaders. At this juncture an old farmer arose and asked how so large a bee could enter so small a hole. The agent was evidently master of the situation and blandly remarked this was no business of his whatever; this is the *bee's look-out.*

After so much talk on the tubercle bacillus, what it does and what it does not, the writer is somewhat in the position of the old farmer, and asks how the tubercle bacillus enters the healthy organism? The reply is equally logical: "This is the look-out of the tubercle bacillus."

This seems the only answer ever given by the bacteriologist. Is there no other? We think there is. The fighting qualities of the tubercle bacillus, like the Spaniards, is vastly over-rated. Each desires little to do and plenty to eat. Neither would forcefully enter a harbor for temporary or permanent rest. How, then, do the tubercle bacilli gain a footing? By falling as a seed by the wayside and simply taking root; by eating the first food that pre-

sents and satisfying a natural craving or hunger. The tubercle bacillus is not seeking whom it may devour. It never goes out foraging, but is everywhere present, and wherever there is suitable soil, simply grows. It is evident that a soil must precede the growing organism. Every biologist will acknowledge the accuracy of this statement—first the soil, next the organism and lastly the growth.

Say not, then, that the tubercle bacillus is a parasite. It is not a parasite. It is a vegetable organism, taking root in a fertile soil. The soil precedes, is prepared for and nourishes the growth of the organism. What is the mission of the organism? That of a scavenger. It takes up the old, useless and worn-out tissue that has no further virtue in the economy. When this effete tissue is wholly taken up the organism disappears. So long as this tissue forms the organism thrives.

In tuberculosis an animal debris is continually present. Suspension of atmospheric influence causes the debris or worn-out tissue. Remove the suspension and you at once remove the formative process. No formative process, no tuberculosis. This information may seem strange; may not be found in standard works; yet is nevertheless true.

The tubercle bacillus is not the cause of tuberculosis. There is another cause, viz., suspension of atmospheric influence in whatever way induced.

With this truth clearly before us and ever in mind, no fear need be entertained regarding the tubercle bacillus. It is perfectly innocent and may be so considered by all. We are living in troublous times. The outlook is brighter.

Let us gird on our armor, fight the battle with courage and take heart for the future.

A crisis is upon us. Men of science have laid out the metes and bounds of knowledge in this disease. "Thus far thou shalt go and no farther." Men of observation, perhaps equally wise, see no progress—rather decadence; observe a weakness or inefficiency in present methods. They boldly ask why this educative empty nothingness. Men of

the schools who hold place, perquisite and power ask why this cadence of invective. Each in his way maintains his right—a battle for supremacy.

It becomes every thinking medical man to use his influence for the right, whatever may betide. Disease stalks rampant through the land. Servitude, if of value, is honorable. Serfdom to a theory is dishonor. In this disease the gall and bitterness of bondage are severely felt. Are we thinking men? Let us feel the chafing of a foreign yoke no longer.

What is tuberculosis? Says one: "An infective disease caused by a germ." Says another: "A systematic disease caused by violation of law." One says: "No tuberculosis without a germ of disease." Another says: "No tuberculosis without violation of law." One holds a vegetable organism or plant growth as necessary. Another holds violation of law or ill-ventilation as necessary. No tubercle bacillus, no tuberculosis. No suspension of atmospheric influence, no tuberculosis. One tries to catch or antagonize a bacillus. Another tries to correct or modify present action of law. One could prevent disease if no tubercle bacillus. Another could prevent disease if no violation of law. One says: "Give us more time; it is a question of science." Another says: "Give us a hearing; it is a question of common sense." One stands entrenched with shield and banner displayed. Another stands in the open, fearing no defeat. What medicine can be more practical than preventive medicine?

FOOD PRODUCT.

No factor is more conducive to the well being of a people than diet or food product. If we turn to history and seek those nations which have secured the most lasting regard or aggrandizement, we invariably find a people well fed. *Per contra,* should we seek the tribe or race lowest in the scale of existence, whose history—if so it may be called—lies in the unwritten legend or tradition, whose home is migratory and uncertain, we find an insufficient diet, with alternate plenty and privation.

So true are these statements, that brawn and brain work most harmoniously and efficiently when food product is adequate to the animal economy; so true are these statements that, other circumstances being equal, given the diet for five consecutive generations, the condition of a people may be fairly determined.

No better illustration can be given than in the examples of Great Britain and India.

Great Britain, synonym for strength, has fought with nearly every nation of the earth, and to-day controls a domain on which "the sun never sets." Great Britain, a land of liberal diet.

India, synonym for weakness, vast in area, population, resources and willingness to pay taxes; vast in little else, controlled by a few thousand alien soldiers. India, a land of restricted diet.

Exchange the food product for five generations, think you their relative strength would remain the same?

As with the nation, so with the individual, though less marked. Show me the man or woman whose whole life diet is scant or insufficient, and I will show you the intellectual or physical weakling. Bone, brain and muscle are built on food ample in quality, quantity and variety. When

little Oliver Twist calls for "more" it is no idle, childish whim or folly, but is an urgent call of wronged nature. The soup is too thin, the quantity too small and the quality deficient. Are there any little children in this land of plenty who are calling for more? Examine closely before you say no.

Thus far we have spoken of normal or wholesome food product. But at times a staple production fails, or is defective or diseased through climatic or other causes. A people dependent on one production must then face starvation or become enervated through diet. The famine in Ireland through failure of the potato crop, or local outbreaks of ergotism through eating black rye, etc., are familiar examples. Again, a food product may be defective in that it is improperly cared for. Mouldy hay or musty grain must impair the health of the animal that eats them. Over-ripe fruits, partially decayed vegetables or meats improperly kept must cause sickness to the consumer. In regard to a food product there is only one royal way—*to select only the best.*

Of food product there is only one with which we all are perfectly familiar; only one that fulfills every indication, meets every want, and in truth is ideal—*pure milk.* Perfect and familiar food as milk is, no article has been more used and misused. To-day it stands eulogized and condemned. One fact remains—*pure milk a perfect food.*

The purity of milk is affected by intrinsic or extrinsic causes. In other words, milk may be changed during secretion or after it is withdrawn. Of the various changes that take place after milking we will not refer, but simply state that they all may be prevented for a longer or shorter period by proper sterilization. Various apparatus are on the market and perfection in this regard seems to be reached.

While sterilization is thus regarded so favorably there is one thing it can *not* do, as will shortly appear.

Of the various changes that take place at or during secretion we wish to speak more particularly.

1. It is asserted by high medical authority that tuber-

culosis animals secrete milk containing bacilli. So far as known, no one argues their presence in the milk. Seeing is believing.

2. That by sterilization the bacilli may be killed and the resultant milk rendered a perfect food.

In the judgment of the writer this statement is as near prevarication as is Bill Nye's description of a cyclone. It contains some truth, but most of it is mythical. That bacilli may be killed by sterilization or that there are cyclones, no one denies. That tuberculosis milk may be rendered perfect food by sterilization is as mythical as Nye's description.

There are two things of which American physicians can justly feel proud—practical ideas and good common sense. Suppose during the famine in Ireland that the Americans, instead of sending a ship-load of corn, had sent a ship-load of sterilizers. Would the famine have been staid? Suppose during an outbreak of ergotism some one should suggest sterilization. My dear sir, we do not eat uncooked rye. It is ground, made into loaves, and sterilized in the oven. The people still die. No sterilization will render a diseased grain or a partially decayed potato perfect food product.

Fondness of a bargain is likewise American. Suppose I have five tons of mouldy hay. It is sterilized after the most approved German method. Is there a physician in the land who will pay a full market price for this hay? The hay is an imperfect food before a mould fungus starts. Killing the mould fungi does not restore perfect hay.

Milk secreted by a tuberculous animal is a diseased product—a diseased product before bacilli are found. Killing the bacilli by sterilization does not restore a perfect milk.

Milk is a secretion—an elaboration—of principles from the blood. If the blood be pure, the milk is pure and vice versa.

It is known that nervous impressions increase, diminish or vitiate the milk flow. It is known that the milk of a

syphillitic is poor in quality, and should be nursed only in exceptional cases.

What shall we say of the milk of an animal suffering from a constitutional disease? To the writer, it seems a fallacy is foisted unwittingly on an intelligent public.

Are there any little children in this land of plenty who are calling for more? Herein lies a secret of the fifty per cent of mortality under five years of age. Believing this, could you conscientiously recommend condensed milk for children, gathered as it is from unknown sources?

Poor as are all artificial infant foods—in that they do not contain the elements of nutrition—they are superior to commercial condensed milk, in that they do not contain the elements of disease.

Some one may ask what is the chemical difference between diseased and healthy milk. Some one may likewise ask what is the chemical difference between a diseased and a healthy potato. Cook them and your three-year-old child will see a difference. Use the two kinds of milk and you will perceive a difference.

Have you ever said to a mother: "You must not nurse your infant. You are in ill-health. The milk is a diseased product"?

In the moral as well as the physical world no man should find fault with present conditions unless he be able to point out a better way.

If pure milk be the only perfect food, if the infant human race must live on milk, the way to obtain pure milk is the desideratum of the century.

1. We must have healthy animals.
2. Animals must conform to hygiene.
3. Every precaution must be taken to keep milk pure.

How shall we obtain healthy animals? What says the New York Health Board? "Use the tuberculin test and kill all diseased ones." To the writer this seems like crossing the valley of Lethe on the bridge morality. The bridge —a very fine structure—*stops in the middle of the river.*

In less than five years New York will again have to adopt the scientific method.

While removing the diseased animals would it not be a higher wisdom to secure healthy progeny by selection? Animals must conform to hygiene.

It is astonishing how inconsistent we are. *Mothers* must be careful of diet, etc., etc., while nursing infants. *Cows* are allowed to be crowded in filthy stanchions, eat mouldy hay, drink stagnant water, without air, exercise or sunlight; milked at all hours, the milk delivered twenty-four hours late, is sterilized and pronounced perfect baby food.

The man who sells rotten bananas and robs you of your child is no more guilty than he who thus cares for his cows and spreads disease and death. They should alike be held amenable to law.

Every precaution should be taken to keep milk pure. Herein lies a field for sterilization.

Look over the able articles written during recent years and you will readily glean a consensus of belief as follows: (a) Diet causes tuberculosis; (b) diet cures tuberculosis; (c) diet prevents tuberculosis; (d) the same article of food taken in the same manner acts in the three ways mentioned, viz: a, b and c, at the same time. (e) Statistics prove all this. Our ascertained facts must be renovated. There is certainly something wrong.

In what does the wrong consist? We believe it consists in a false conception of the nature of the disease, tuberculosis.

We are taught tuberculosis is an infective disease caused by the tubercle bacillus; infective in the sense that one takes the disease from another; caused, in the sense that growing bacilli are commonly found in the disease. So long as these ideas entertain and hold there can be little true progress. To progress there must be a radical change or rather interchange of ideas. Take the common food product, butter. No article of commerce is in more common use or contains greater number of tubercle bacilli.

If present views be correct every time we partake of butter we are infecting our system with tubercle bacilli or causing tuberculosis.

On observation it is evident: (a) That multitudes of people eat butter who do not take tuberculosis; (b) that tubercle bacilli do not take root in the healthy human organism. Hence (c) butter does not cause tuberculosis only in certain diseased conditions of the system.

It follows: (a) Those having this diseased condition should not eat butter; or (b) should eat butter free from tubercle bacilli.

The question now arises, what is this diseased condition of system?

How does it arise or how is it caused, and in what way may we prevent it?

On close observation it is seen only those animals allow the entrance of growing bacilli who in some way have suspension of atmospheric influence. If there be no suspension of atmospheric influence there can be no tuberculosis.

It is then a question of suspension or non-suspension of atmospheric influence, and not a question of eating or not eating butter; not a question, *per se* whether tubercle bacilli be present or absent in said butter. If the reasoning be correct, instead of a microscopical examination of butter to determine the presence or absence of tubercle bacilli, we should examine the family history or environment of the party eating butter.

The same reasoning may be applied to milk.

No greater fallacy exists than that milk causes tuberculosis. Yet it will take years to teach the public to think otherwise, because we are so imbued with the germ theory of disease. The truth will at last prevail. Some time, sooner or later, we will know better. In the accepted way, we have spoken of diet as causing tuberculosis. Let us now refer to diet as a cure of the disease. It is observed by all clinicians that tuberculosis patients recover most rapidly who have good digestion and assimilation. They who can eat food and digest it, increase in flesh and put on a healthy

appearance. They are certainly getting better. *Per contra,* they who are scant eaters, or they who have poor digestion gradually lose in flesh and become worse. They lose in flesh from lack of nourishment and from the waste constantly going on. Herein lies the secret, if there be one, of the so-called cure.

Diet of food, rich in fat, if readily assimilated, restores the waste constantly going on. Does it cure?

It is certainly an efficient aid in cure. Should the cause of the disease be steadily at work, no true cure is effected by diet.

Does diet prevent tuberculosis? That there be no misapprehension we refer to one or two writers as expressing a belief that it does. Is this true? "Next to a life in the open air, perhaps even more than that, the question of food is of the utmost importance in the prevention of tuberculosis, as well as in the treatment of the disease."—Youth's Companion, March 31.

Speaking of hygienic treatment: "Of equal importance with pure air is the selection of proper food and its digestion and assimilation," etc.—Lancet-Clinic, Feb. 5.

These writings are selected simply to show the trend of modern instruction. They express what is being taught on every hand: That proper food is equal to pure air as a preventive of tuberculosis.

The writer thinks not. Proper food or diet *per se* will never prevent tuberculosis. Pure air *per se* will ever prevent tuberculosis. Taken together there is no equality.

Improper or insufficient food causes inanition.

Impoverished or impure air causes tuberculosis.

In inanition there may be or there may not be tuberculosis.

In tuberculosis there is always inanition.

To briefly summarize:

Diet does not cause, cure or prevent tuberculosis. If true, how can the action of a, b and c take place at one and the same time? If true, are tubercular statistics of value?

What is tuberculosis? A constitutional disease, dependent largely on the evils of civilization and governed by the following law: The death rate from tuberculosis is in direct ratio to suspension of atmospheric influence.

THE CAUSE OF TUBERCULOSIS.

United States Indian Service,
Yankton Agency,
Greenwood, S. D., August 24, 1898.

Dear Doctor:—I have read with great interest your article in the last number of the Medical Record. I have held your views for some time. I have in my experience the best illustration imaginable.

I have attended the Indians both here among the Sioux and in Idaho among the Bannocks. I have known many Agency physicians and have talked with them. All agree that the older Indians say they did not have consumption among them when they lived in teepees and in the open air. But as civilization advanced among them the government has constructed log cabins and small frame houses for them, and they have given up the teepee except a short time in the hottest weather of summer. Now we have consumption the most prevalent disease. More than half of the deaths are from it.

In examining Indian children as to their physical fitness for school it is almost the rule to find tubercular glands in the neck or some evidence in the lungs. The joints of Indians and *mixed bloods* are rarely attacked by tuberculosis.

These houses are mostly low, having one room; many are log cabins with dirt floors, sealed as tightly as possible, the whole family living in this one room, and except in summer, cooking there on a large cook stove, heating the poorly-ventilated room to furnace heat, and after perspiring freely, going into the cold air. They are in the transition stage between savagery and civilization, mentally, morally and physically. This may account in some measure for the fearful hold this disease has on them, but I think tubercu-

losis came with the house and "suspension of atmospheric influence."

Would it be wise to embody these thoughts, rambling, in a paper to help prove the great factor, suspension of atmospheric influence?

I trust you may find some interest in these remarks, and I thank you for the new light your valuable paper has thrown on the subject for me.

Believe me, I am, very truly yours,

GEO. F. POPE, M.D.,
Agency Physician.

The above letter is self-explanatory. The article referred to is found in the New York Medical Record of August 20, 1898, and is one of a series now numbering nearly forty. In these papers it has been the endeavor of the writer to express a continuity of thought and establish the law of tuberculosis.

The law and the proof of its existence may be found in the Transactions of the Ohio State Medical Society (1893). So far as known no writer has attempted to controvert this law. Its author stands its champion and advocate.

To some it may seem strange that disease obeys law. Why not? Is not everything in this universe subject to law? Why not disease?

Malaria, the writer feels assured, is governed by law. He has so expressed himself in one or two published articles. So that whatever view may be entertained as to the plasmodium of this disease, please remember there is a law of malaria.

Cholera, the writer has long thought, is governed by law. The visitations of this disease are no mere chance visitations. Law underlies them in every instance.

So we think in every disease there will be found a law. Knowing the law, we can the more readily control the disease.

Medicine of the future will be largely preventive. In the past the effort has been to find a remedy that will successfully combat the symptoms of disease. This is well.

we have a substitute of such remedies. In the future it will be the desire to determine the law that governs disease. This will be better, in that we can the more readily predict the time, place and extent of disease zones. Then there will be less confidence in remedies and a greater confidence in means of prevention. All hail this happy day! It will surely come.

Malaria is a disease whose treatment is fairly well understood. In its worst type it is not considered a distinctly fatal disease. It is largely epidemic and its visitations are under control.

Cholera is a disease to other climes, and visits our land only under certain conditions and after the lapse of years. With this disease we are not so much concerned.

With tuberculosis the case is different. This disease is with us at all seasons and is extremely fatal. It takes our nearest and dearest friends, and when once its grip is felt its hold is seldom relaxed. It is a strangely fatuous disease. The patient is ever having a slight relapse, never worse, gradually improving all the time, and dies in this belief.

There is another fact. No treatment is of lasting benefit. The physician calls it a bronchitis, assures a cure, receives a retainer, until he who runs may read tuberculosis.

Nor is this act of the physician a mere love of gain. At first he believes what he says. He then modifies his prognosis as the disease advances. At last, for fear of competition, he holds his patient by mere force of will. He says in his heart: "I know you cannot be cured, but you must not be a patient of my competitor." What a shame! Tuberculosis thus advances year by year without one thought of cause or cure. Of course, we are speaking of the rank and file of the profession. What shall we say of them whose title, dignity and rank but belittle the name they bear? "Miserable comforters are ye all." The classic lore still gilds the page, but blinds the intellect. When will ye be wise?

In the Medical Review, October 5, 1895, the writer

recalled the words of the Psalmist: "He brought them forth also with silver and gold; and there was not one feeble person among their tribes." The estimate being variously given as from one to two millions, where could we find such a people on the face of this earth to-day? Certainly, not among the civilized.

He also recalls the statement of the classic historian, Lossing. Speaking of the Indian tribes embracing the greater portion of the north temperate zone, Lossing says: "Physical deformity was unknown, and there were few diseases among them." Could tuberculosis have been present? We think not.

Prof. Osler is also referred to in the same article as saying: "No race is immune. The Indians of this continent are very prone to the disease. Matthews, whose experience with the native race is large, states that the disease is on the increase among them."

The writer asks, how is the disease on the increase among them? *As they come in contact with civilization.*

Listen to Osler's own words, same page (Practice of Medicine, p. 185, 1892): "The death rate in the older reservations, as in New York, is three times as great as in Dakota." That is, the death rate is three times as great where the Indians are in contact with civilization three times as long; or, in other words, the death rate is in a direct ratio to contact with civilization. Could any testimony be more conclusive?

Carefully read the above letter, and you have the unasked testimony of one from the field. Is it not a satisfaction to know we have reasoned correctly? Is it not a greater satisfaction to see medical men in authority indorse the same view? Would it not be a still greater satisfaction to see the dread disease, tuberculosis, banished from our midst? It certainly would. *It shall be seen,* but perhaps not in our day. "The world do move."

Turn back the page of history and walk with me in the streets of Ephesus. It seems but yesterday Diana, that ancient goddess, blindly ruled a queen. Around her stood

the workmen and knelt the votaries at her shrine. Who dare blaspheme her name? The workmen saw that in their craft was gain. They wildly cried, "Great is Diana, the Ephesian goddess!" What now remains of this once lordly queen? Perchance a broken column proclaims the place she stood.

The times have changed. We worship now around another temple. It is a German mosque. The worship is as senseless as of old, the gain far greater, the maddening cry of workmen yet more deafening. Who now dare speak against this altar? Here and there a still small voice. That voice will yet be heard.

Along the shores of time are wrecks of theories. Here a broken rudder, there a mast, tell plainly of a palace in the years gone by. It long has disappeared. So will it be with this.

THE GERM THEORY.

"And he sat in the tent-door in the heat of the day."—*Genesis 18:1.*

The text needs little elucidation. The one spoken of is no less a personage than the patriarch Abraham. Of all worthy historic characters none stand more prominent.

Born in Ur, of the Chaldees, about thirty-nine hundred years ago, Abraham, under a providence not his own, became wealthy and the head of a numerous household.

We read: "The Lord had blessed Abraham in all things."

It is not the purpose of the writer to dwell in detail, but his was a noble character, not perfect, but worthy of emulation.

Two things are obvious: Abraham dwelt in a tent, and he rested at mid-day.

The climate of Chaldea is such that life in the open air was common. Plainly, yet warmly clad, they dwelt as did their fathers, in tents and booths. Life to them was sweet in simple joys, which knew no after pain.

Happy we, if in our race for greater joy had recognized the pain thereafter!

Man seeks greater, closer habitations; he builds a house. In building, had he kept the ventilation as in the tent or booth, all would be well. He builds regardless of an inner air, and garners as he sows—a spurious joy in dread disease—tuberculosis. In this we recognize a father's care is greater than man's protection. This, we think, is wisdom.

Abraham rested at mid-day. Some think he idly sat, while others worked. The writer does not think so. He had been working, but at mid-day, while the heat was great,

sat resting in the tent. A lazy man can never rest. Some may suppose he sat and slept; the record does not say so. "And he lifted his eyes and looked and lo," etc., showing plainly he was wide awake—alive to duty.

Multitudes are sitting, idly dreaming of the castles in the air, while the few are slowly moving upward, step by step, the golden stair. Of this few was plain old Abraham.

Let us pursue the picture:

"And lo, three men stood by him, and when he saw them he ran to meet them," etc.

May we not learn a lesson? Abraham sat, and looked and saw and acted. Let us imitate his example.

Perhaps to-day no one thing is receiving greater attention from the medical profession than the germ theory of disease. Hundreds of Abrahams are sitting in their tents. Some, I verily believe, are resting. Many, wide awake, are looking with powerful microscopes and troubled gaze. Is the theory true or false?

What is seen? In diseased conditions certain germs or microbes at the seat of lesion. At times, one kind alone; at others, more than one.

What is seen? Myriads of bacteria or growing plants, subsisting on diseased or worn-out tissue in frail, unhealthy patients.

What is seen? A growing vegetation in a fertile soil. This is seen on every hand. Along the shores of lakes are seen the shoals of many fishes. At times, one kind alone; at others, more than one.

What is seen? Myriads of the finny tribe subsisting on the food there placed, or propagating species of their kind in favored places. This is seen. Abraham could have seen the same and that without a microscope.

As the fish along the shore take up the food and propagate their kind, so bacteria in unhealthy tissue.

Do bacteria cause disease? Another class are looking, with microscope as fair and eyes as bright. They say, in words our own, no microbe *per se* can cause disease, unless said microbe be diseased itself. Wondrous knowledge!

My friend, good bye. How can we yet determine the sickness or health of any microbe.

Let us pass on. In passing would it not be wiser to assert that microbes are found in the environment most favorable to growth? The seed is scattered everywhere. It falls in fertile places and takes root. Growing germs are found where there is proper food; where proper food they propagate their kind.

Do they cause disease? Look again. "Bacteria in their growth develop toxines." If by toxines is meant vegetable poison or alkaloid; if by develop is meant store up in their substance, this statement is true.

"These toxines are given off by the growing vegetable organism." Abraham, where art thou? This, the writer thinks, is far from the truth. He finds no such fact recorded in nature. Living plants do not give off their alkaloids while growing. They give them up only by infusion or extraction. Illustration: Strychnia, morphia, atropia are vegetable alkaloids. Do the plants give off these poisons in growing? How utterly absurd! This the writer endeavored to make plain some two years ago, *vide* "Status of the Bacillus."

In order to be clearly understood let us make a simple experiment. Put fifty pounds of rich earth in a box. Plant poppy seed in this earth. Place under the most favorable conditions of growth—light, heat, moisture, etc. The seeds germinate, the plants soon grow and develop to maturity. How do we obtain morphia? Is there a physician in the land unable to answer? Listen to the bacteriologist: "Plants in growing develop toxines. These toxines are given off in growth."

How do bacteriologists obtain morphia? By collection from air, earth or water? If not, why not? Do not plants in growing give off toxines?

The following bacteriological experiment is very common: Into a flask containing a small amount of bouillon, put a number of living tubercle bacilli. Let them multiply for several weeks. Filter out all the bacilli and inject a lit-

tle of the filtrate beneath the skin of a guinea pig. See how quickly it succumbs. This, they say, is proof positive the plants give out toxines to the fluid in growing. The writer thinks not so. A plant in growing absorbs or inhibits the soil in which it grows. If the poppies in growing take up one ounce of soil, there is just forty-nine pounds and fifteen ounces left. If in growing they develop one ounce of opium, this one ounce is found in the plants. No where else. As the plant in the earth, so the plant in the bouillon.

Have we made this plain? If so, let us take another step.

One suffers from tuberculosis. Tubercle bacilli are growing in his system. How are the symptoms of the disease commonly explained? Toxines are developed by the growing organism or bacilli. These toxines are thrown off by the bacilli in growing and continually poison the patient. Reason says the proper way to treat the disease is to give a remedy that will neutralize the toxines as thrown off by the vegetable organism.

The writer smiles when he thinks of such foolishness. He at the same time feels vexed that men high in authority should make statements so erroneous.

What is tuberculosis? A constitutional disease dependent largely on the evils of civilization and governed by the following law: The death rate from tuberculosis is in direct ratio to suspension of atmospheric influence.

In other words, tuberculosis exists before the entrance of the growing bacillus; one has symptoms of the disease before there is evidence of the growing germ.

ARTIFICIAL IMMUNITY.

The world in many ways is growing wiser. A few centuries ago they little thought of the progress to be made in the arts and sciences, of the methods of travel, war, commerce, etc., now in vogue. Could past generations rise and view the strides taken we think they would truly be illuminated.

Medicine, like other things, has been moving. While here and there the movement is retrograde, the general trend has been ahead. Should those ancient gods or myths in medicine arise we think there are many things for them to learn. But hold! Some boldly assert the dead already know more than the living. If true, they keep this knowledge to themselves.

There is no reliable evidence to establish intercommunication. We have little sympathy for thinking men who consult or worship dead medical heroes. The writer believes a "live dog is better than a dead lion." The light of these men went out in their death. It is seen only in their works—"Footprints on the sands of time."

In mathematics certain facts are so plain they need no demonstration. Illustration: The shortest distance between two points is on the straight line between them.

Other facts equally plain are based on an assumption. Illustration: Two and two make four, *i. e.*, according to our system of notation.

We assume one is one. If one be two, then two and two make eight.

These two forms of truth we will designate as innate and assumptive. The two forms are found in medicine.

There is this distinction. Innate truth is accurate under all conditions. Assumptive truth may be or may not be accurate in these same conditions. There is a wide dif-

ference in the meaning. The one is truth, the other assumption.

One who reasons and uses truth and assumption as synonyms may find fallacy in his conclusion.

Have we made this plain? We believe that he who claims a possible immunity from tuberculosis by the injection of an alkaloid of the plant tubercle bacillus is laboring under the mistake named—taking an assumption for a truth.

If the writer be correct, the reasoning is of necessity fallacious. If assumption and truth be used synonymously one has no moral right to ask acceptance of his teachings. Let us be honest.

In discussion one is apt to be carried away by the heat of argument and utter things which he would not in his more sober moments. This is true in all controversy. The fire which generates steam if too strong may cause an explosion. No explosion is desirable. Let honesty of purpose and fervency of spirit be the motto. The subject demands it.

With one-seventh of the death-rate caused by this dread disease, taken largely from a people in the prime of life and otherwise well fitted for years of usefulness, let no man stand by the deathbed of his fellow and trifle or deceive. Rather let us be honestly in earnest.

"Tuberculosis is caused by the tubercle bacillus." What evidence have we of this?

(a) Tubercle bacilli are found in the disease tuberculosis. A murder is committed in a certain village. A, B and one thousand others are found in this village. Is this proof positive that the one thousand and two committed the murder? Would any lawyer, judge or jury so regard it? Tubercle bacilli are found in health. Is their presence the cause of health?

(b) Tubercle bacilli are found growing in tuberculosis. Please examine this answer carefully. We desire it. Rushes are found growing in a certain pond. Do the rushes cause the pond? Is not the pond a suitable place for

the rushes to grow? In tuberculosis a diseased condition is present. The diseased condition is a suitable place for the tubercle bacilli to thrive. Being found growing in this diseased condition is no evidence these plants caused the condition named. How utterly absurd! That no one think the writer has gone daft on this subject, we herewith append the following letter:

Colorado Springs, Col., October 8, 1898.

Dr. H. H. Spiers:

Dear Doctor:—I wish to say most positively that in what you say regarding the cause of tuberculosis, etc., "I am with you," and that it is only a question of time before the whole truth will be known. I have studied consumption now for sixteen years, both in laboratory research and in a general practice among consumptives, and I have many facts to prove beyond question that the tubercle bacilli only attack a tissue prepared for it. Flies only "blow" a dead horse, as the cowboy says.

Hoping to meet you some day, I am,

Very sincerely,

C. F. GARDNER.

With the above statement before us we trust no one will henceforth talk of tubercle bacilli creating a soil in a healthy subject. They do no such thing. In every case of tuberculosis the soil is prepared before the bacilli take root and grow—prepared in one way—suspension of atmospheric influence. Hence the law of tuberculosis: The death rate from tuberculosis is in direct ratio to suspension of atmospheric influence. This law the writer has advocated for the past twelve years. If true, the disease tuberculosis can be controlled.

(c) Tubercle bacilli or their pure cultures are injected into healthy guinea pigs. In every case these animals die of tuberculosis. This, says the germ theorist, is proof positive the tubercle bacilli cause the disease. Let us examine. Admitting the injection causes the result named, it is necessary to show (1) the human race is a race of guinea pigs:

(2) the method of injection is nature's method. Neither can be shown.

(d) Tuberculosis is infectious. Example: Mr. H., aged twenty-five, is in poor health. He marries a healthy girl. Two or three years later the husband is told by an M. D. that he has tuberculosis. Mr. H. takes but little medicine, confines himself almost wholly to the house, and the wife who is very much attached to him, stays long in the same room and ministers to his wants. One year from his first illness he dies of tuberculosis. His wife dies of the same disease about six months later. The neighbors say, "She caught the disease from her husband."

If one take the disease from another in what way is the infection conveyed? In other words, if tuberculosis be due to suspension of atmospheric influence, how can this suspension be conveyed to another person? Do not be too hasty in judgment. Let us hear a further recital.

Mr. B., of P., aged twenty-three marries Miss T., of E. His family history is decidedly bad. At the present writing all the family—parents, children and grand-children, nine in number—are dead. The family tree is extinct. With but one exception all died of tuberculosis. One child, I think an infant, died of diphtheria.

Mrs. B., his wife, aged twenty-one, is healthy, but never robust. About two years after their marriage Mr. B. dies of tuberculosis. His wife is very attentive in his sickness and does everything possible for him in her power. Eighteen years have elapsed. Mrs. B. looks older, but is in as good health today as in those days of her marriage. Will any M. D. in the land assign a reason why Mrs. B. did not take the disease? Do not be too hasty and we will recite another case.

Mr. B., of E., aged twenty-two, of poor family history, imperfectly recovers from typhoid fever. Two years later he marries Miss H., of about the same age and of fair family history. They settle in the township of R., and build a new house. Two children are born of this union, the elder still living, though delicate; the younger, an infant of six

months, dies of tuberculosis. The father dies of the same disease about six weeks later. Mrs. B. cares for both husband and child during their illness. Eight years have elapsed. A month or two ago I met this lady on the streets of this village, the picture of health. Why did the second Mrs. B. escape this disease?

In both cases, narrated from life, the reason is simple. Need I explain? It is these little things which tell me *the laws of tuberculosis must be true.* It cannot be otherwise. How did they escape? By having perfect ventilation in the rooms occupied. There is no danger whatever of "catching" or contracting tuberculosis if the ventilation be perfect. Why? Because the tubercle bacilli cannot create a soil in the healthy individual. The soil is created by suspension of atmospheric influence. Write this in your note book, I solemnly declare it is truth. How, then, does a wife or husband "take" the disease from a partner? By living in the same environment, which is an improper one. This truth was shown many years ago. We have referred to it before. We refer to it again:

"From the statistics of the Brompton hospital, collected by Drs. Cotton and Edwards, it has been shown that of the many nurses and others engaged in that institution during twenty-one years, but one nurse and one servant died of phthisis. Especial care seems to have been taken in the Brompton hospital in regard to ventilation and other hygienic conditions. Dr. Cotton's expression is that 'a residence in the consumptive hospital and long-continued working in its wards is a very good way, indeed, *not to catch the disease.*" (Reynold's System of Medicine, vol. II, p. 117, revised by Hartshorne.)

It is seen that especial care is taken in this hospital in regard to ventilation, etc. What other hospital has taken like care? What other hospital has a like record? It is not that we know less than formerly, but is it not true we have gone daft after a germ theory? Is it not true our present system of medicine is so *Germ*-anized that we think of little else except germs?

It is therefore seen if a, b, c and d are the valid reasons why tubercle bacilli cause tuberculosis, the statement that they do cause said disease is assumption. If assumption be used as a synonym of truth, the conclusion is fallacious.

To return, if tubercle bacilli do not cause tuberculosis, how can we rationally say their alkaloid affords immunity?

THE BICYCLE A PREVENTIVE.

The world moves on wheels. How rapid the pace!

"Art is long and time is fleeting."

As we look from our window and see the many swiftly gliding by on wheels, the question arises, how will the race be fitted for the "struggle for existence" in the years to come?

On the good to result from the use of the bicycle, as of other things, there is a diversity of opinion. Whether the bicycle prove a benefit or a curse will largely depend on its proper or improper use. Some predict a future race of humpbacks, with deflected spinal columns, etc.

The writer takes a more hopeful view. He thinks as time passes the wheel will be made more specially adapted to individual wants. Each person cannot wear the same clothes. Why should wheels be made so nearly alike? The tall and stout, the lean and the obese should each have a wheel adapted to his needs. The novelty in use will wear away. Each will learn while there is celerity in movement and time saving in use, there is also a limit to physical endurance.

In the future we will be more conservative of our powers. Grace in riding will be sought in the future. We cannot all be handsome. It should be the aim to ever appear at our best. So that taking all in all, we are inclined to think many of the evils now existing in the use of the wheel will pass away.

Beauty in the wheel will give way to grace in riding. Rapidity in motion to comfort in using. Novelty to utility and the world will be made better by its introduction.

There is a phase in its use on which we wish to dwell. *The wheel leads to out-door exercise.*

The toiling millions have exercise enough, say some.

Where is this exercise? In the dusty shop or ill-ventilated hall. Mechanics, merchants, orators, laborers, all breathe an atmosphere absolutely impure. In this great world of ours, with the vast oceans to purify the air, should we breathe such vile stuff? No! A thousand times no!

What are we doing in breathing impure air? The lodgment of dust in the air cells of the lungs causes suspension of atmospheric influence from without.

The inhaling of impure or impoverished air causes suspension of atmospheric influence from within. What does suspension of atmospheric influence induce? *The precedent state or condition; tuberculosis in its incipient state.*

What does exercise in the open air accomplish? The inflation of the air cells of the lungs and the inhalation of volumes of pure air. *The prevention of the precedent state or tuberculosis.*

Who most readily take tuberculosis?

They who have the greatest suspension of atmospheric influence.

Who most readily convey tuberculosis?

The mothers of our land. Mothers, let us have more wheels. They prevent tuberculosis, the greatest evil of civilization and the greatest foe to the human race.

LEGISLATION.

A legislator should be argus-eyed. All feel the burden of taxation, have ideas of just and unjust law, and recognize the worth of public officials. Taxation should be equal, laws just and officials honest. This the legislator should know. He finds it difficult to place the burden of taxation equally, to know at all times a just from an unjust law, to be strictly honest on every occasion. The law giver may strive to do his duty, fulfill all the necessary conditions, yet be misunderstood or misrepresented by many rivals and fail at the next election.

These are a few of the trials or tribulations which every law giver meets. Truly, the legislator should be argus-eyed. He should have great wisdom. Legislation is asked on a subject of which little is known. This is an unjust demand. Education should precede legislation. The legislator has the right to ask enlightenment. A subject is clearly understood, yet there is a diversity of interest or opinion. One party asking, another denying, legislation. Here great wisdom or its opposite may be shown.

It is a function of the legislator to exercise tact and judgment. In the exercise of these success or failure is assured. Barring those cases of exceptional wisdom and tact in the legislator, legislation can advance no faster than the public sentiment which lies behind. In a republic we have no moral right to ignore our laws. It is we, the people, who make them. The legislator is only our instrument. He should be wise.

We have spoken of honesty. Without this all other traits or characteristics will fail. No matter how wise, persuasive or brilliant, if honesty be lacking, no worthy legislation can be assured. It may be said if one be wise, he will also be honest. Not necessarily so. There is a worldly wis-

dom without honesty; a love of office or power with evil intention. "A devil's purpose with an angel's face."

If, then, we have correctly reasoned, three things are essential in the legislator, viz., many eyes, wisdom and honesty.

Having spoken of the essentials in a legislator, having referred to the difficulty of always securing proper legislation, and the necessity of education preceding it, we now take up a subject on which a great deal has been said, little formulated, and less put into execution. We refer to legislation on tuberculosis.

It is the consensus of medical belief that tuberculosis can be controlled. The medical world is shouting this on every hand. Let the legislator ask the question, in what way can tuberculosis be controlled? Many are silent, more are indefinite, and a few continue to talk without ideas. Some physicians have this latter faculty in an intense degree. It is not a faculty to be sought in prayer. Our prayer should rather be, not more words, but ideas.

It is evident the method of ridding ourselves of this deadly disease will depend largely on its cause. If we have a large vested interest in bacteria, having traveled and studied extensively at great cost, no doubt it will measurably shock our sensibility and pride to be told that bacteria are of little worth in tuberculosis, and may be ignored entirely in the control of this disease. If the truth is to be spoken, let not a vested interest swerve us to the right or left. Legislators should be wholly disinterested.

Again, if we hold a chair in some school of medicine, let not the emolument of office or the pride of power prevent the discernment of right and wrong. Let our motto ever be, learn to unlearn that which has been learned amiss. Knowledge sought and won in this way is power. To the thinker, no other knowledge is worthy a place.

If rightly understood, we now have a wise, honest and disinterested legislator. He asks: "What is tuberculosis?" We answer, a constitutional disease dependent largely on the evils of civilization and governed by the following law:

The death rate from tuberculosis is in direct ratio to suspension of atmospheric influence. Please observe, in this answer no reference is made to the tubercle bacillus whatever.

According to the writer, then, the wise, honest and disinterested legislator will take no cognizance of the tubercle bacillus in framing a law for the prevention of tuberculosis. All laws framed will be against the evils of civilization; none against the tubercle bacillus.

Says one: "Do we understand there will be no legal notice taken of promiscuous spitting?" None, whatever. This, we think, is a proper subject for education, not legislation. People should be educated to be cleanly in their person, habits and environment. We think one could no more be legislated into cleanliness than into righteousness. Each is a subject for education.

But says another: "Is it not true that tubercle bacilli are continually floating in the atmosphere? Must we not prevent this?" Says the writer, it is true that tubercle bacilli are found in every atmosphere, more prevalent in some than in others. Two questions present: (1) Can we prevent their presence? (2) Would prevention be of value? On the answers given these questions must hinge all law against the germ.

In regard to the first, every medical man will agree that it is absolutely impossible to destroy all microbes or bacteria in the atmosphere. Why attempt the impossible? Suppose we could destroy all bacteria in the atmosphere, what would it avail? Bacteria are present in the food we eat and the water we drink. Suppose we could destroy all these? If it be shown that tubercle bacilli do not cause tuberculosis, of what avail the destruction? The widespread disease tuberculosis would still be prevalent. With the premises before us, no other conclusion could be reached.

The reasoning of the germ theorist is somewhat as follows: Tuberculosis is caused by the plant tubercle bacillus. The more plentiful the germ in the atmosphere, food or

drink, the more prevalent the disease, and vice versa. Could we in any way diminish the number of tubercle bacilli, we could diminish the prevalence of tuberculosis in the same ratio. Germicides, control of sputa, etc., diminish the number of tubercle bacilli per cubic foot of air space. Therefore, germicides should be used and the sputa controlled. These, therefore, are proper subjects for legislation.

This reasoning seems plausible, yet it is fallacious. Let us examine. In the first place, the prevalence of tuberculosis is not in proportion to the number of tubercle bacilli in the atmosphere. Some will say at once that this is not true. It is true.

We have already referred to the observations of Drs. Cotton and Edwards in the Brompton Hospital for Consumptives. Conditions in hospital, ventilation and hygiene good. Number of years in observation, twenty-one. Number of attendants who died of the disease, one nurse and one servant. Conclusion: "A residence in the consumptive hospital and long-continued working in its ward is a very good way, indeed, *not to catch the disease.*"

Take the same conditions except ventilation. Think you no attendants would have died? All attendants would have died of the disease. Why? Because imperfect ventilation is suspension of atmospheric influence, or a condition in which the living tubercle bacilli enter the system and grow.

In the two cases wherein is the difference? Opening or closing a window or door does not alone determine the absence or presence of tubercle bacilli in the atmosphere. How foolish! There must be something else. What is this something else? *It is the perfect ventilation that renders the system immune.* Here is the immunity long sought, not an injection. It is the imperfect ventilation that renders the system a fertile soil. Hence the law of tuberculosis.

The corrected proposition, then, reads: "The prevalence of tuberculosis depends on ventilation, not the number of bacilli." This is an important consideration, one

which the biologist would do well to stop and investigate. We hardly look for this at present, he is so thoroughly imbued with a germ theory.

In the second place, tuberculosis is not caused by the plant tubercle bacillus. We have spoken of this in other places. We endeavor to be brief at this time.

It is evident to any thinking mind that a plant cannot precede the soil in which it grows. Please consider: The tubercle bacillus is a plant, the soil is the being in which it grows. The being in health does not have growing bacilli. Why not? There is no soil. So soon as suspension of atmospheric influence takes place in said being so soon a soil is present and so soon the tubercle bacilli take root and grow. Is this plain? When the ventilation is perfect there is no soil, and consequently no growing bacilli. This is true, no matter how few or many tubercle bacilli are in the atmosphere. If, then, the ventilation be perfect, there is no danger whatever of catching the disease tuberculosis. In this condition the tubercle bacilli are perfectly harmless.

We are writing to rational beings. How, then, ought we to proceed? Attempt to destroy the harmless tubercle bacilli, or render the ventilation perfect? Which view ought to engage the attention of the wise, honest and disinterested legislator? There can be but one answer, legislation should be for better ventilation. Leave the tubercle bacillus alone; it needs no care.

In the course of events, as tuberculosis becomes less prevalent, through a purer atmosphere, the tubercle bacilli likewise become less. Whether few or many, it matters little if the ventilation be correct.

What, then, shall we say of germicides and the control of sputa? Germicides are of little worth. It is not necessary to use them. Tuberculosis can be controlled in a better way. Every one should care for his sputa, but the care of it is not a proper subject for legislation. "Cleanliness is akin to Godliness." Cleanliness should be taught.

If the writer's conclusions be correct the reasoning of

the germ theorist must be fallacious. What, then, is a proper subject for legislation? Ventilation.

In order to present this subject in a clear light perhaps one or two illustrations would be proper. In referring to these it is not to condemn any particular system, but simply to illustrate. The cases chosen are the ones which come most readily to mind.

In the elevated railroad of New York a method of rapid transit is in vogue that is unsurpassed in this country. The trolley or horse car of other cities is excellent. All these systems have one fault, viz., the ventilation of the crowded car is poor. The writer has been on the New York road when every inch of available space was occupied, no room to stand. The same may be said of the horse car line on Broadway as it was a few years ago. This condition of things ought not to be. The situation seen in New York is seen in many other large cities. Every seat in a car should have proper air space for its occupant. Every occupant should be given a seat. Then the question of ventilation is settled at once and forever. The ventilation of the car should also be perfect. In short stops and frequent changes this would be materially aided by frequent opening and closing of the doors. In long runs the case is different. Here the most perfect ventilation should be secured. One source of annoyance in long distances is the irritant dust. How to eliminate this and at the same time secure perfect ventilation is a question for science. Its present aim seems to be how best to catch, destroy or eliminate the bacillus. The writer thinks its field of action should be changed.

But ill-ventilation is not seen in the car alone. It is seen in the hall, church or shop; in truth, wherever people congregate. It is also seen at the fireside in the home. When will we learn wisdom? "Wisdom is the principal thing; therefore get wisdom."

It may be said the question of legislation, in regard to ventilation, is a complex one. It is complex, yet it is very simple. Pure air is abundant. It is also free. Why should

there be difficulty in obtaining it? The first question to consider is one of desire. Do we, as a people, desire pure air? If it be best for us to have it, if it be abundant and free, why should we hesitate? It seems to the writer it is a question of education alone.

There are many things we earnestly desire. They cannot be obtained, or if received they spoil us or injure our health. When a necessary is to be had at so little cost we should reach out our hands and receive or demand it as our right. This is American.

We are taking a journey. The car or boat or bus is crowded. One passenger desires pure air; the rest are satisfied as it is. The conductor or captain or cabman is asked to open a window or door. Many at once object for fear of taking a cold, and the window or door is closed. All suffer from the closure. Do we not need education? A consumptive or one having a cough enters this crowded car or boat or bus. He coughs or expectorates from necessity. The one in authority says: "My dear sir, or madam, you must not spit in this car." "Why not? Have I not purchased a ticket?" "Your ticket is all right, but you must not cough and expectorate while on this car." "My dear conductor, why do you not give us pure air?" "You talk to the authorities about that." The authorities are investigated. "We are perfectly willing to conform to any reasonable public demand. Scientists tell us there is great danger from dried sputa. It becomes disseminated through the air and causes consumption, etc. Scientists are silent as to ventilation."

Do we not need education? We certainly must educate before we can legislate. Legislation without public sentiment behind it is a dead letter. Education and legislation, like twin sisters, walk hand in hand.

What, then, shall a traveling public demand of its carriers? Perfect ventilation, abundant air space and a seat for all.

How shall we render our halls, churches, schools, etc., less dangerous? By having them more perfectly ventilated.

This can be accomplished in many ways: (a) Less seating capacity or larger air space; (b) better heating apparatus, in that less atmosphere of the room is impoverished, i. e., by having greater heating surface and less intensity of heat less oxygen is abstracted from the air in the room; (c) an abundant supply of pure air partially warmed before entering the room; (d) an exit for all vitiated or impure air. These taken collectively, with a proper construction of the building or room, will fulfill all needs.

Many churches or halls are erected as to external appearance or acoustic properties. While these must not be lost sight of, the ventilation of the building is of far greater importance. The life of the audience is of more value than the beauty of structure or voice of speaker. Architects, in making designs, should think of this.

What shall we say of the home? Our home is where we live or abide. Where is the home? In the country or city? Is it our own or another's? Or, rather, do we hold or rent? The answer to these must modify the answer given. If in the country there is greater opportunity to breathe pure air. The same may be said if the home be our own. In rented flats or rooms in the city we receive that for which we pay. If able to pay we receive the best; if unable to pay we must take that which we can get. With the poor wage earners it is often take the poorest or none at all. How comfortless are these! How illy ventilated! Often, how short lived the occupants! Cannot legal restraint give them better homes?

We have often thought in visiting country homes, what a field for cultivation! How lovely and pleasant some of these homes are! What taste and munificence! Yet oftimes it is outward adornment like dressing the hair or body, not that inner fitness so essential to worth or usefulness. Seldom does the architect or builder think of that inner adornment—ventilation. What a pity! In other homes, how destitute and comfortless! The home is a mere hovel or shelter.

It is not the elegant home that confers health and longevity. Frequently it is the poorest. One log cabin the writer recalls, which contained a large family. It was so open the stars could be seen through the wall on either side. Yet that family lived in that home many years. Little sickness, plenty to eat and do made that home a happy one. The family grew to manhood and womanhood, separated and organized homes of their own. How beautiful the picture! This is not seen in every home.

CONTROL.

Of all historic diseases which have afflicted mankind, no continuous disease has been less subject to control than tuberculosis. There have been epidemics or endemics that were more fatal or less subject to control for short periods of time. But these have been only for short periods. These diseases die out for want of fresh fuel, or their very contagiousness has demanded great effort, which has resulted practically in control.

With tuberculosis the case is different. This is a disease with which we all are practically familiar—one which every medical man thinks he understands. The very clearness of apprehension with which he thinks he sees leads him blindly on in treatment or prevention. Hence no stop or cure.

It is a common impression that tuberculosis is due to a germ. If true, the germ being killed the disease would at once cease. Methods of destroying germs are familiar to all. It is plain to the ordinary observer they are of little value. Germicides *per se* being valueless, it enters the minds of some that perhaps a condition of the system may be induced that will prevent the entrance of germs, or—may be better—will not allow their growth. Germ cultures are procured and their alkaloids used to fortify the system or render it immune. With a pains-taking accuracy worthy a better result, these germs are isolated, cultivated and the alkaloids injected for this purpose.

The result is before us. Is tuberculosis lessened by injections of these cultures? There are many occupying chairs in medical colleges who would be pleased to answer in the affirmative, but facts do not bear out the assertion. Instead of boldly saying no, which would be the writer's course, the attempt is made to waive a direct answer to the

question and encourage a hopeful view for the future. At the same time these teachers are continually instructing in methods which have long since proved practically *nil.* Is such instruction a benefit? Finding it impossible to kill the germs in the air or in the person without injury, finding immunity largely an imaginary quantity, men have in some quarters advocated germ-proof houses. It is soon seen by all except a few fanciful scientists that even these germ-proof buildings could be of little value.

The question now arises: If present notions prevail, how soon will tuberculosis be under control? No one can clearly answer, for no one knows. Under the circumstances, would it not be wisdom carefully to investigate the cause of disease and see if there be not some other connecting or underlying condition which allows the living tubercle bacillus to enter one's system and grow? If such condition be found, would it not be further wisdom to inquire if this condition is always present in the growth of tubercle bacilli in the human organism? If always present, would it not yet be further wisdom to ascertain if this condition cannot be removed, and thereby prevent the entrance of a growing bacillus in one's system? If this condition exists, is always present, is removable, we hold in our hands an effectual weapon for the prevention of tuberculosis.

The writer claims that here is a succession of facts the force of which cannot be weakened by any argument. In other words, here lies a chain of reasoning on which the law of tuberculosis is based. This law is based on facts as immutable as in any law of Kepler or Newton. This law must stand. What is the law of tuberculosis? The death rate from tuberculosis is in direct ratio to suspension of atmospheric influence.

Having laid down a law of tuberculosis, let us now critically examine the facts on which this law is based. My attention was called to these many years ago. The first published article bearing on the subject is found in the December number of the Cleveland Medical Gazette, 1890.

Phthisis pulmonalis is here spoken of as a zymotic disease. Medical experts had so placed it, and this opinion was accepted without question. Upon investigation the contagiousness of the disease was in doubt. It was found there are certain conditions of the system in which one apparently takes the disease. There are other certain conditions in which one does not take the disease. The question arose: On what does the contagiousness or non-contagiousness of tuberculosis depend? In answer to this, it is seen that certain animals are affected and the same animals are not affected, according to the condition in which they are housed or kept. Some in authority have lately asserted that food or diet has as much to do in the origination or starting of tuberculosis as has the atmosphere. The writer thinks that in this statement there is a misconception. It is not the atmosphere *per se,* but suspension of atmospheric influence that induces the condition or disease. Food or diet, according to quantity and quality, may improve or weaken the physical or mental condition. This I think is about all. Suspension of atmospheric influence, whether the animal be weak or strong, will produce a condition of the system which allows the tubercle bacilli to enter and grow.

While suspension produces a condition favorable to the growth of a germ, food produces simply a strong or weak condition of the system and has no relation to the germ's growth whatever. This, I think, is a marked difference, and one which even late observers have entirely overlooked. Again, it is evident that if the basic facts be changed, the law depending on those facts must be worked differently. This accounts largely for the change made in the law.

Another fact may be referred to at this time. It is very difficult for some to enter into a discussion or investigation in which figures or mathematics are used. In order to accommodate this class, the law is stated in the simplest language possible. The writer feels assured that those who impartially investigate the subject will find the conclusions accurate.

With this simple law before us as demonstrated, with

the deadly disease before us as seen, it is the writer's hope and belief that much may be accomplished in a practical way by simply living in accord with the teachings of this law; by avoiding in every possible way the suspension of atmospheric influence. A deadly enemy is before us. In every engagement thus far we have met defeat. Let us train our guns to do the most effective work. Before entering in engagement it is always well to take an account of the character of weapons to be used. One great difficulty in the recent past has been that the bacteriologists have taken upon themselves the entire work. This I think is a mistake. Bacteriology is one arm of the medical service. Its work along its own line is of great value; its work in other lines of no value whatever.

To illustrate: We have many ships in our navy—battleships, cruisers, torpedo boats, etc. Suppose a captain of a torpedo boat should say, "My boat will act as a battleship." Or the captain of a battleship should say, "My boat will act as a cruiser." Or the captain of a cruiser should say, "My boat will do the entire work; the rest of you may remain idle." What would be the condition of the navy? Any one could see that the service would be of no practical benefit whatever. We might as well do without a navy as to have one boat arrogate the entire service to itself. Thus with bacteriology. Bacteriology has been pushed forward to the exclusion of everything else. I trust some of my contemporaries will see the force of this assertion.

There is another insuperable difficulty which bacteriology has met in the battle with tuberculosis. It is assumed that tuberculosis is a germ disease. If it were a germ disease, rationally considered, it could be met with germicides or the alkaloids of germs. It not being a germ disease, rationally considered, germicides or alkaloids of germs would be of no value. Whether the disease be due to a germ or not, I leave to an intelligent profession; this much is certain, bacteriology has thus far found no cure for the disease. The same may be said of other methods of

treatment. The writer believes that the secret lies in recognizing the cause of tuberculosis. It is plainly evident if the cause of tuberculosis be suspension of atmospheric influence, no line of treatment could cure without first recognizing the cause and removing it. Even then, if there be destruction of tissue, no treatment could restore tissue lost. These facts must be taken into consideration when talking of cure. So that he who asserts he has a cure for tuberculosis either falsifies or is ignorant.

There being no cure for tuberculosis, it remains to be asked: In what way can we arrange our forces most effectually to battle with the disease? To the writer it seems clearly evident that the control of the disease must be largely along the line of prevention. Now do not misapprehend. The writer believes that open air and constitutional treatment are of great value. In truth, in conjunction, they are the best treatment of tuberculosis known to the science of man. At the same time, to repeat a well-worn aphorism: "An ounce of prevention is worth a pound of cure." There is no cure for tuberculosis. There is prevention. If prevention succeeds, there is no need of cure. Today this hydra-headed disease exists on every hand. There is need of prevention and there is also need of treatment. Insidious and deadly in its nature, say not to the afflicted that there is no value in treatment. There is value in treatment. But if cure be perfected, treatment must be given in the precedent state or incipient stage of the disease. Then there is cure. But, as said in a previous article, if there be disorganization or breaking down of lung tissue, this tissue can never be restored. Yet even in this condition treatment is of value and by its judicious employment life may be prolonged, and aid and comfort given the afflicted. This alone is certainly worthy our consideration.

To speak directly of prevention, the first step to be taken is to remove the cause of the disease. If the disease be due to suspension of atmospheric influence alone, the first step in prevention is to remove the suspension. Without this nothing can be accomplished. With this much

can be accomplished. If due to heredity in conjunction with suspension, here the battle must continue as long as life lasts. Heredity is an entity of the parents, and must be controlled in the rising generation by proper marriage. Let no one marry into a consumptive family should he desire healthy offspring. Evidently the marriage relation is a serious one if we look at it in the light of transmission of disease. Every one who asks in marriage should have a clear health register and he should expect the same of his partner. Without this tuberculosis will remain a disease in the human family to the end of time. With this tuberculosis can be controlled.

In a recent session of our legislature some one introduced a bill to regulate marriage. What became of the bill the writer only conjectures. One thing is known—the way in which the measure was received. Some spoke of it as ahead of the times; others as visionary, unnecessary, ridiculous, etc. It is not worth while to discuss the merits of this particular bill. This much is certain: In the years to come some measure of this character will be enacted to prevent disease. Education must ever precede legislation. It is education today, legislation tomorrow. In this way, step by step, the human family has risen in civilization. The laws of Ohio today could not be enforced in present China. The laws of Ohio, it is hoped, will be changed for the better in the years to come. True, it is difficult to legislate on marriage. To say one must or must not is somewhat arbitrary. Is it not best to do so? When one is educated to select only the best in marriage, it is more largely a matter of choice or judgment and less one of impulse or emotion. Not long since a man of this city, pointing to a deformed child, said: "If nature could give me no better body than has that child I would ask to be shot." Please reflect! What was nature's act other than the volition of the parents? Why not legislate?

Reverting to suspension of atmospheric influence, this may be induced in many ways. The following classification presents the subject in the clearest light possible:

SUSPENSION OF ATMOSPHERIC INFLUENCE.

- From without
  - Impure atmosphere { Ill ventilation, vocation, etc.
  - Impoverished atmosphere { Over-heating rooms, improper ventilation, etc.
- From within
  - Defective lung tissue
    - Original. { Heredity.
    - Acquired. { Disease, exposure, etc.

To explain more fully, suspension takes place in two ways—from within and from without.

From within through original or acquired lung tissue. Though the scalpel or microscope may detect no difference in lung tissue, it is observed that children of consumptives take the disease more readily than children of the healthy. Why? Defective lung tissue—heredity. Such children will tolerate no confinement. Confinement to them means death from tuberculosis. These children die from the disease, while other children escape—ventilation, food, physical exercise, etc., being the same; thus showing that there is a difference in the organism or lung tissue. It is also observed that those having stenosis of the air passages whether congenital or acquired, are more subject to tuberculosis. Why? Suspension of atmospheric influence. In some of these cases operation to remove the stenosis is beneficial. In all, there should be perfect ventilation.

There are certain diseases which tuberculosis is pretty sure to follow if precaution be not taken, viz., measles, pertussis, etc. Why? Defective lung tissue—acquired. Suspension or atmospheric influence due to thickened lung tissue. What precautions are necessary? Perfect ventilation during sickness and recovery.

From without, through impure or impoverished atmosphere. Every observer has noticed that there are two classes in particular who suffer much from tuberculosis—they whose vocation or calling keeps them continuously in the dust and they who suffer from confinement in ill-ventilated rooms. In the first class there is suspension from

lodgment of dust particles in the air cells of the lungs or from mechanical irritation of the same—one or both, commonly both. What is the preventive? Avoidance of the irritating dust. (1) Change of vocation, (2) wearing of a dust protector, (3) elimination of dust by a dust collector.

If heredity be a factor, the first method should be adopted. No one should engage in or follow an unfavorable pursuit if the subject of hereditary influence. Though the usual precautions were taken, the probability is he would die of tuberculosis. If the subject be vigorous and have a good family history, he may follow the vocation of his choice. In this case a dust protector is of service, but unequal to a dust collector. In all shops where there is an irritating dust these collectors should be obligatory.

We now reach the topic of impure or impoverished atmosphere. This has been explained elsewhere, but a word or two in this connection will not perhaps be out of place. We, as Americans, are living in homes many of which are warmed by furnace heat. In all homes there is artificial heat for a part of the year. In these homes the atmosphere is at times impoverished. As a result the occupants suffer largely from respiratory and constitutional disease. Tuberculosis is of this number. It is prevalent and deadly. Treatment is of little avail. Prevention is of value. The preventive, the writer is inclined to believe, consists in a stove or furnace of at least double the size or capacity of the one ordinarily used. It takes no more fuel, the heat is more constant and even, and the stove or furnace lasts longer. There is, therefore, no greater expense in the end. There is an assurance of better health. The danger in cold weather is that too much oxygen is withdrawn from the room to support combustion, and not enough air is let in to replace the oxygen abstracted. Suspension of atmospheric influence is induced. In this way plants and animals alike suffer.

There is another factor which should engage our attention. I refer to the irritant dust of soft coal stoves and furnaces. In the present arrangement of these, nearly all

[illegible] smoke or vapor. Irritation of the [illegible] tubes commences soon after [illegible] not be. The draught should be [illegible] dust in the room. If it is not [illegible] suspension of atmospheric influence be- [illegible] also because of the lack of [illegible] consequent tuberculosis. When these [illegible] understood and acted upon, the writer [illegible] death rate from tuberculosis will be much [illegible] this statement is worthy of considera- [illegible] refer to the atmosphere as found in [illegible] villages. In large cities, as a rule, it is [illegible] impure. Large cities are railroad centers, [illegible] workshops, etc. There are of neces- [illegible] of smoke. At times the outdoor air [illegible] Science can and no doubt soon will [illegible] nuisance of cities.

[illegible] other factors, not mentioned, in cities which [illegible] air and render it unfit to breathe. I pass [illegible] or two others I mention which aid respir- [illegible] absence makes breathing more difficult. I [illegible] baths and gymnasiums.

[illegible] if the person be kept clean, a certain [illegible] physical exercise be taken, and pure air con- [illegible] there is no danger whatever from tuber- [illegible] there be no heredity. Tuberculosis can be con- [illegible]

STATUS OF THE BACILLUS.

"The bacteria are now admitted to belong to the vegetable kingdom and to constitute the lowest forms thereof." —Dr. E. O. Shakespeare.

There is a law of vegetable growth. Rationally considered, the low form of organism or its microscopic nature does not militate against or invalidate this law. In other words, there are certain conditions which must be complied with in the growth of perfect vegetation.

PLANT LIFE.

(a) *Conditions of Growth.* Heat, solar or artificial, is necessary in the germination of every seed and in the fructification of every plant. Without heat, plant life or plant growth lies dead as inorganic matter.

There must also be moisture. Heat may awaken a latent energy in plant life, but if continued without moisture the agency that awakens destroys.

Light is also a potent influence. Heat may awaken life, moisture may continue life, light alone perfects and thereby perpetuates the life begun.

In the continuation of plant life these three factors are always present, and, so to speak, in an intense degree. No one of the three factors can be ignored. The bacteriologist with his culture media, etc., etc., recognizes these principles and applies them more or less in his field of labor. We say more or less. Heat is necessary; the temperature below a certain point little change takes place in the culture media. Moisture is necessary; no growth can develop without moisture. Light is necessary: with a perfect action of the other two, light is essential to fruition.

In the construction of the ordinary culture oven, if a provision be not made for the generous admission of light, will the vegetation be a perfect one? At the end of an in-

definite series, a culture becomes attenuated. In what way? There are many things a flood of light would illuminate.

But hold! The tubercle bacillus *dies in the sunlight.*

"The tubercle bacillus dies under sunlight, in thin layers in the course of a few minutes or hours, but perishes under diffuse daylight only in the course of a week."—Dr. Jas. T. Whittaker, Ohio Medical Journal, July, 1895.

One other condition is necessary—a suitable soil. This will be referred to later on.

(b) *Modified by Environment.*—Observe trees in a dense forest—tall, straight and without limb until near the top, in the crowded fence row—fan-shaped, with limbs to the earth; in the open—short, with branches extending in all directions.

That a variable condition of the tubercle bacillus is due to environment is shown in an article in the Cleveland Medical Gazette, June, 1894, by Dr. C. W. F. Muenchehofe.

(c) *Elective in Location.*—Sitting in a wood in Western Illinois I counted fourteen varieties of lumber trees on less than two acres in area. This is remarkable. Seldom do we see more than three or four varieties on so small a space. There are forests of oak, pine, cypress, etc. Often several kinds are intermingled, but usually one or two kinds predominate.

The reason for this absence or predominance is probably plant dislike or affinity for certain soils. We know from observation that native trees do not thrive equally well in all localities. There are certain spots in which native trees refuse to grow. Change but a few rods distant and at once they begin to thrive. Seeds from forest trees are scattered year by year in these waste places. They fail to take root and flourish. The voice of plant life is the voice of the maiden: I marry, but not whom I dislike; I grow but with affinity.

In the distribution of bacteria many species are often found in the same tissue.

"Different species of bacteria are so frequently associated together in substances that afford them nourishment

that some method of separation is essential for intelligent study, etc."—Dr. Shakespeare.

At other times well-nigh pure cultures are found.

"The main habitat of the tubercle bacillus is the lungs and the sputum is sometimes almost a pure culture."—Dr. J. T. Whittaker.

One of the greatest difficulties in the past has been to isolate in order to cultivate. It is thought this difficulty is now entirely overcome.

With the removal of one barrier another appears. It is found the germ takes root in some soils and in some it does not. The reason for this affinity or dislike can only be conjectured. Instead of explaining in a perfectly natural way by saying it is owing to drainage or chemical constituents of the soil, there arises the strange hypothetical doctrine of phagocytosis, which is in substance that on the part of host and invader armed battalions are constantly on guard. On the least provocation a free fight begins. As neither party will yield, it is a war of extermination.

It is readily seen how such a theory could arise on the continent. It is an every-day picture. It is not so clear how such a theory could become established among intelligent Americans. But it is simply wonderful the amount of trans-Atlantic idol-worship that is present among us.

On this topic, as many others, revelations will arise. It is to be hoped they will be more in consonance with reason and common sense.

(d) *Absorption.*—This topic is taken up with a degree of trepidation. Plant growth is shrouded in mystery. What the vital principle, when enters it the plant, how transmitted to the seed, death occurs in what way?—these and many other questions are as mysterious as life and death in the individual.

The diversity in growth is involved in mystery. Two children, born of the same parents, reared with the same care, grow up together—the one virtuous, the other vicious. Mysterious? Not more so than the growth of plants.

Two seeds from the same tree are planted, the soil,

moisture and sunlight alike to each. The one is straight-grained, the other twisted. Mysterious! Perhaps the child, by bent of inclination, received the vicious tendency and grew as moulded. Perhaps the embryo tree met some obstruction and turned in growing, remaining thus as tree. Mystery when made plain is mystery no longer.

The growth of plants indifferently from the same soil is somewhat mysterious. The beech, the maple, the oak, grow side by side. It seems there must be a difference in the elements assimilated.

How diversity of labor is performed on the same food is mystery. Three persons sit at the same table. One rises an orator, another a hod-carrier, the third a nothingness until the next meal. It seems there must be a difference in the elements assimilated.

There is a difference. All living organisms grow by absorption, or perhaps better, assimilation.

To the vegetable world the soil is the food. Suitable soil means proper elements properly prepared. Whether the soil be prepared by the care or folly of man it matters not, nature appropriates as found. This thought should carefully enter the mind of every one seeking a cause or cure for tuberculosis.

There is a difference. Each plant takes the element best suited to its nature, leaves the rest. One has more, another less. All must eat or die.

Example: Mr. R. plants a field to corn for eighteen consecutive years. The field is occasionally fertilized as others. Year by year the crop of corn becomes less and less. On the eighteenth year there is a good growth of fodder, but no corn. The soil for corn is exhausted. Without fertilizer the same field yields a large crop of oats the ensuing season. Here is a lesson showing the value of rotation in crops.

No doubt each tree takes nourishment appropriate to itself and leaves the rest. Another tree absorbs from what is left. In this is seen a gathering up of all, or Nature's providence.

But, however rich a soil may be, it avails nothing to the growing plant unless it be rich in assimilable elements. To this subject my attention was early called in planting trees. All things considered, those trees grew best which were planted with the greatest care, in having all rootlets well cared for and the earth well pulverized around them. This much for soil constituents.

In two articles on malaria, published in the Cleveland Medical Gazette, September, 1891, and April, 1895, the question of plant absorption of an element extraneous to the soil is dealt with. This must suffice for the present.

Much as is known of the life history of bacteria, their growth is involved in mystery. Why arise these microscopic organisms? Is their office eliminative or destructive? Does their presence in disease constitute the disease *per se?* When once in possession of a soil, can the soil be reclaimed? These and kindred questions may be asked in all earnestness, and yet the answer be a hollow mockery.

The presence of the bacteria in disease—causal—and the presence of the same bacteria in health—harmless—is mysterious.

Mystery made plain is mystery no longer. If we look upon the bacteria as vegetable organisms—and the highest authorities in the land view them as such—the way is clear. As already stated, all organisms grow by assimilation. The presence of a growing organism implies the presence of assimilable food. The presence of assimilable food implies *a something before the organism takes root.*

Which has the priority, the something or the organism? Will some bacteriologist please tell us in what this something consists? Mark the issue, in this something *the cause of tuberculosis.* Control this something and you control the disease.

Can tuberculosis be controlled? *Per contra,* the presence of a living organism—not growing—implies the conditions are unfavorable for growth, for it is as natural for organisms to grow under favorable conditions as it is for the sun to shine or water to seek its level. If, then, other

conditions be the same, in health as in disease, the growth not being the same, the cause or causes must be sought in the soil. Other conditions, light, heat and moisture, are supposed to be the same. A fair deduction then, is, the difference in growth is due to a difference in the soil.

If, then, we take this rational view of the question, it is unnecessary to consider the hypothetical doctrine of phagocytosis at all. In other words, the peace of Europe does not demand an armed intervention.

But say some, "The tubercle bacillus is a parasite." What is a parasite? We will let the Standard answer: (1) "A living organism, either animal or plant, that lives on or in some other organism from which it derives its nourishment for the whole or part of its existence, as a louse, tapeworm, mistletoe or dodder." Yes, the tubercle bacillus is a parasite.

One question please: Did you ever know of a person's head being so healthy that a louse could not live on it? Does the mistletoe invariably grow most luxuriantly on the tree half dead? Look around you. Did you ever hear of a tape-worm being found in a healthy *primæ viæ?* Does the potato beetle always select a sickly potato?

"Come, let us reason together."

Why does the tubercle bacillus select a sickly subject? Why does the tubercle bacillus fail to grow in the healthy subject?

"Your reason, Jack, your reason." What! upon compulsion?

Yes, armed phagocytes at the portals.

The changes produced by the tubercle bacilli are mysterious.

"The body which we term a 'tubercle' presents in its early formation nothing distinctive or peculiar, either in its components or in their arrangement."—Dr. Osler.

I. e., before bacilli enter or are planted, "tubercle" is the same wherever found. The bacilli enter.

"The bacilli then cause, in the first place, a proliferation of the fixed elements with the production of epithelioid

and giant cells; and, secondly, an inflammatory reaction, associated with the exudation of leucocytes. How far the leucocytes attack and destroy the bacilli has not been definitely settled."—Dr. Osler.

The writer has a simple taste, but he thinks when a plant takes root it begins to grow; that in growing it absorbs nourishment from the soil; that whatever the plant gains the soil loses. There must be a change while the growth is going on. Change can be detected.

All pathological talk has been on what is found in or after growing. What is taken up by the plant? What is lost to the individual? These are questions that should be answered.

The "agreement" of modern pathologists is mystical. Illustration:

"Modern pathologists have agreed in this, that only such products, though histologically the same or similar, as contain and result from the specific bacilli, deserve the name of tuberculosis. Thus tuberculosis is defined an infectious disease."—Dr. A. Jacobi.

Suppose the farmers of Ohio should agree that, inasmuch as a horse has so many excellent traits, he shall henceforth and forever be called a man. As a result of this agreement would the horse hereafter walk on two feet?

While it is perfectly right and proper for the pathologists or farmers to act in the premises, their action or inaction *makes no change as to facts.* The horse still remains a horse. Pathological agreements are not solid rock against which the medical writer can indifferently place the Archimedian screw.

This is a question of mal-absorption or assimilation.

Theological writers have been accused of cultivating a third eyelid. Medical writers have, and use, only two: *Schliesze beide Auglein zu.*

(e) *Diffusion.*—The earth teems with life in the springtime, when plants drink the moisture and sunlight. The air teems with life in the summer, when plants give the world their fragrance.

Plant Absorption and Diffusion.—Thus is taught a great lesson in nature: Secure, give. Man has perverted this lesson: Acquire, hold.

It is not primarily a lesson in charity we desire to teach; the rather, to study plant diffusion and observe the lesson therein taught as closely as we may. Perhaps this study can be introduced in no better way than by an illustration:

The city of Ravenna, O., has a water supply inferior to none in the State. Drawn from Crystal lake, it is distributed through mains to various parts of the city. Being soft, clear and pure, it is satisfaction to all who use. At a certain season of the year, and for eight or ten days, usually in July and August, the water has a peculiar taste. I am told this taste is due to vegetation in the lake, which blossoms at this period. Since the intake has been supplemented by wells in the immediate vicinity of the lake the taste of the water is not so marked at the period named. At any rate, if my informant be correct, here is a clear case of plant diffusion through water. The aroma of flowers, of birch, pine, etc., is familiar to all.

Diffusion Through the Air.—If our senses were acute enough to perceive them, no doubt constant change could be detected in the soil, due to plant absorption and diffusion. Our natural sense is too dull to perceive them, and the chemist is baffled in detection.

Query: If growing plants diffuse an entity to surrounding media, cannot the same action take place within as without the body? Or to put the question more directly: If growing plants diffuse to a fluid media, cannot living bacteria diffuse to the fluids of the body?

If yes, may not these diffusions markedly affect the organism containing said bacteria?

Let us examine.

"Recent chemical examinations of the contents of pure cultures of various pathogenic and a few other bacteria have shown the existence therein of certain peculiar poisons, not only possessing specific physiological action, but

also having peculiar chemical properties and constitutions which ally them more or less closely to certain well-known poisonous vegetable alkaloids. These chemical bodies have been named ptomaines."—Dr. E. O. Shakespeare.

The willow is a native tree of North America. In the United States many of these trees grow along the banks of the smaller streams. As an anti-periodic the willow has long been known. The medical properties are found in the bark. In 1825 Fontana declared the active principle to be salacin. Ptomaines and salicin are then similar in each being developed in the living plant.

"Pathogenic bacteria have been killed in their pure cultures by the action of heat. * * * The culture medium then injected, produces a series of symptoms, etc."—Dr. Shakespeare.

Willow trees may be boiled, i. e., a decoction of willow is made. Its administration, *per orem* or injection, produces a series of symptoms, and acts as an anti-periodic. Similarity is here closely allied.

"Again, these pathogenic bacteria have been removed from the fluids of the pure cultures by means of filtrations. The filtered fluid has been inoculated with similar results."—Dr. Shakespeare.

A filtration of willow yields an anti-periodic. Listen to the conclusion:

"From these reasonings it would seem probable that it is the alkaloid developed by the growth of the bacterium which is the specific active agent in the production of the disease."—Dr. Shakespeare.

I. e., the writer takes it, the alkaloid passes from the growing plant into the fluids of the body and causes the disease.

An Ideality.—John Smith, M. D., has long been a delver of German medical literature. He owns a farm in Ohio. Through this farm runs a small stream. Along the stream are many clumps of willow. The banks of the stream are shaded near its entirety. John has peculiar notions. He drinks deeply of the fatherland. His reasoning

is as follows: "Salicin is made from willow. In order to procure salicin the willow tree is destroyed. Why this waste of timber? German medical literature says salicin is continually passing from the willow to the soil. If to the soil, then to the stream, for it cannot pass through the underlying clay. Why not boil the water and procure salicin from the stream? A perpetual annuity." John Smith establishes a plant for the manufacture of salicin. We will not speak of its capacity at this time. For some reason it has not grown rapidly. The neighbors think *John in the borderland of dementia.*

What shall we say of our dear German brothers and many American followers?

A truth is impressed which should be known to every observer. The fact that a plant develops or manufactures and stores away an element or principle in its organism while growing is no evidence this element or principle is of necessity given out in its life to surrounding media.

As John Smith, M. D., is wrong in his reasoning that salicin is given off by the growing willow, so is every one wrong who assumes a living plant throws out its alkaloid during life. The writer thinks it does no such thing. That a plant which contains an element or principle may be made to yield the same by some method of filtration is plainly evident. That the plant tubercle bacillus does yield such an element by heat and filtration is known to every scientist. This element is the much vauntedd tuberculin, the so-called remedy for tuberculosis. The failure of this remedy has been an ignominious one. Yet through all we see the *savant* Koch the least to blame. He thought he had secured a remedy for tuberculosis. Honest, though mistaken, mankind is fallible. Let it pass.

John Smith, M. D., failed in the manufacture of salicin. He at once converted the plant into one for the removal of the willows. He reasons thus: "Tuberculin is very efficacious in the sloughing of superficial tubercular tissue. Tuberculin is the fluid extract of the plant tubercle bacillus. Salicin is the alkaloid of willow. Salicin in solu-

tion ought to cause sloughing of superficial willow roots in the soil."

Some people are *always* doomed to failure. John has met success at last. He says the solution is efficacious, but succeeds best if poured on the willow roots while *very hot.*

In the judgment of the writer, Dr. Shakespeare is right in calling the ptomaine of bacteria an alkaloid; wrong in supposing the alkaloid passes from the growing bacterium to the fluids of the body.

Say some, if tuberculin is a failure in the treatment of tuberculosis, it still remains the best agent known in the diagnosis of the disease. A locksmith is working eight years in the perfection of a burglar-proof lock. He announces the lock ready for trial. A committee examine the same and report the machine of no value as a lock, but in the meantime find and add: *It is an excellent plaything for the baby.*

What do you think of the report as to the lock?

So soon as treatment demonstrated tuberculin of little value, one would naturally think the use of the vegetable extract would wane. On the contrary, advocates rise in a night, like mushrooms in a pasture, and the remedy sells at fabulous prices. It is, then, not a plant diffusion, but a diffusion of microscopes of high power. Money flows into German coffers.

Ladies and gentlemen of the profession, in all sincerity, is it not high time to call a halt? Are we professional thinkers, or are we incorrigible asses?

(f) *Diffusion.*—Microscopy as a science has done much to increase medical knowledge. Its use is recognized and its revelations regarded as of intrinsic worth. By its means certain diseases are now clearly diagnosed which were formerly obscure. Organisms have been discovered and described which hitherto existed only in belief or imagination. The road of the intellectual practitioner has been made plainer and more perfect, the thoughts elevated to a higher plane. No one to-day decries the use of the microscope. It has come to stay.

Medical chemistry is also a welcome guest. During the last two or three decades its strides in behalf of an advanced profession have been great. It has opened a way by means of which many urinary and other diseases are clearly recognized and ameliorated. Its aid to the practical diagnostician in many cases has been immense. As medical practitioners we are debtors and feel kindly for its guidance. Like microscopy, no one fully educated speaks lightly of the clearness of vision it gives in apprehending so complex a subject as suffering humanity.

Microscopy and chemistry, as enlightened practitioners, we welcome you.

But great as microscopy and chemistry enlarge our field of usefulness, something more is required than these. Microscopy or chemistry did not suggest gravitation to Newton or the glacial theory to Agassiz. The clear perception and description of animal life by Darwin was not given by either.

Professional men are apt to forget and must be continually reminded that the field of medicine is a broad field. He who reasons must reason from no narrow or special premise. The premise must be broad as the conclusion. The writer thinks the narrowness of the premise is a lack in modern methods. With this breadth of reasoning there must likewise be an acute observation. Without the latter all reasoners are apt to fail. Broad education and acute observation are two essentials in the advancement of medical science. The possession of these, with a love for the work and an earnest desire to search only after truth, the progress in medicine is assured.

There are at present two prevalent ideas. For the want of better terms we will name them the specialist idea and the generalist idea. The one is a specialist, the other a general practitioner in medicine. Each reasons from his especial field. Both claim accuracy. The specialist claims prestige in his particular field. This is right. Work along particular lines ought to be better work. The generalist

claims a greater outlook. This is right. One looking from many points has a clearer perspective.

Some one thing is sought in a certain field. Who best to seek? The specialist. Something is found requiring determination. Who best to determine? The specialist. Some one thing being found, who best to generalize and assign its field? The generalist. Something being determined, who best to name its systemic action? The generalist. Thus each has his field of labor and each works best in his especial line.

The microscope reveals a plant life in tuberculosis. Had not this plant life been so revealed it might never have been disclosed. Thanks to the specialist. This plant life is proclaimed the cause of tuberculosis. By whom? The specialist. Is he now in or out of his especial line? If out, how shall we regard his judgment? The plant tubercle bacillus is analyzed. An alkaloid or ptomaine is discovered. This alkaloid is declared the active cause of symptoms in the disease. By whom? The specialist. Is he now in or out of his especial line? If out, how shall we regard his judgment?

With these facts before us we claim acute perception or observation will do more in the solution of tuberculosis or, if you please, will do more for a suffering humanity than all speculations in existence. By observation it is seen (1) that the plant tubercle bacillus grows in certain soils—none other; (2) these soils are prepared for the natural reception and growth of the bacillus in one way—none other—abeyance of atmospheric influence. Place these two propositions together and then ask, can tuberculosis be controlled?

What has this to do with plant diffusion? This is a diffusion of plant ideas.

It is seen, then, that fitting or preparing a soil is all that is necessary. If this be all, how does plant life come into existence? This may be answered in the simplicity of Topsy in "Uncle Tom's Cabin," "I spec's they growed." No one truly plants bacilli except the bacteriologist. He

plants when, where and how he pleases. Selects and fits his own soil, cultivates or not as he deems proper, and reaps his reward—a harvest of bacilli. The world is little wiser. Did I say no one plants except the bacteriologist? Let me correct this statement. Every one plants who fits a soil, whether it be in his own person or the person of another. There is this difference—the planting of the bacteriologist is an artificial one; the planting as seen around us is a natural one, induced by artificial life. The one is an artificial soil selected by man's care, the other an artificial soil induced by man's folly, the one an artificial soil in that nature does not lurk in wait with culture media and hypodermic needle, the other an artificial soil in that natural soil has no growing bacilli. Both are artificial in the sense of being either selected or induced.

You say that preparing a soil is all that is necessary. Can a natural soil be prepared? Yes, in from one to twelve weeks if the environment be favorable. What is meant by environment? Illustration: Take monkeys from the forest —tuberculosis unknown among them since the days of Adam. Place them in close rooms and examine them from week to week. What do you find? They are dying of tuberculosis. Perform the same with other warm-blooded animals, as man. A similar result. How do you account for it? Can you secure the same result by any other means if you allow the animal free access to the open air? But, says the bacteriologist, the close room means not only suspension of atmospheric influence, but also the presence of the bacillus. Eliminate the bacillus and will the animal then die of tuberculosis? The reply must be similar in nature. Are we not told the bacillus is ubiquitous? Is it not everywhere present? Can we by any possible means control its absence or presence? What is the use for one to ask the impossible? If the tubercle bacillus truly causes the fatal disease—if we cannot prevent its presence—what is the use of being foolish? *What we cannot amend we must endure. We must abide the presence of the bacillus and that which it causes—tuberculosis. There is therefore no hope from the*

ravages of this most intractable disease under present teaching.

This seems probable from an examination of the death rate from the disease in Germany, the so-called medical center of the universe. The American mind is pre-eminently practical. "The way to resume is to resume." Why not practical in the management of tuberculosis? It is seen there must be a peculiar or particular soil before the growth of the bacillus takes place. This soil must precede the advent of the germ. *Why not control the soil and let the germ take care for itself.*

Suspension of atmospheric influence being the cause of the primary condition or precedent state, it is plainly evident the character of the soil is under control. The soil under control, the disease is under control. This, the writer thinks, is the only effectual common sense method of controlling the disease.

ABEYANCE OF ATMOSPHERIC INFLUENCE.

While attending lectures at Ann Arbor, Mich., in 1874-5, Prof. Ford clearly and forcibly demonstrated the nature of lung tissue. Speaking of its tenuity, he compared it to the finest tissue paper in existence. The paper-maker's art has advanced in twenty years, but normal lung tissue remains the same.

Into and through this tenuous tissue courses the life-giving principle, the blood; into and through this tenuous tissue passes the life-giving principle, the oxygen. The one surges from within at every heart-beat, the other surges from without at every inspiration.

It is seen that in order to have perfect aeration there must be a normal lung tissue, a heart-beat that sends a continuous stream of blood to every part of the lungs, an inspiration that renews continually the atmosphere of the air cells—yet something more, the joint and harmonious action of the two, or a correlation of force. If from any defect in the organism, original or acquired, the blood or air does not reach the lungs at proper times or in proper quantities, aeration is defective.

Perfect aeration means more than this. It involves a perfect machinery or organism plus a pure atmosphere. Aeration in other words is ventilation of the blood as it flows in the life current. As the river in its onward flow receives the oxygen of purification, so likewise the blood. The completeness of aeration is proportional to the completeness of ventilation. If, then, the writer clearly apprehends perfect aeration, it embraces primarily a normal lung tissue, a correlation of force and a pure atmosphere.

While it is true digestion, circulation and aeration are performed by separate organs in the economy, no organ can say its action is alone. Each is dependent on the other.

So with the lungs. A healthy organism is then presupposed.

The stomach, heart and lungs being supplied with the same arterial blood, other circumstances equal, one would rationally consider the function of each equally well performed. The same is true of other organs. But the nerve supply, which seems to designate or determine the work or conditions of work for each organ, is very different. So also is the work each organ is called to perform.

While the stomach, heart and lungs are supplied with motor branches from the pneumogastric—a cranial nerve—the organs of respiration are also furnished with sensitive branches from the same nerve. In other words, it seems a design of creation that the *brain should control respiration.* Yet not entirely, for it is seen that the three organs named are also supplied with branches from the sympathetic. But they are supplied in a very different manner, as one would naturally infer from the nature of the work required.

While the stomach has a comparative paucity of plexuses and ganglia, the heart has an extensive system—a complicated net-work—in this regard. The lungs are marked by ganglia on all filaments extending to the bronchial tubes, and as stated, by a combined system of motor and sensory nerves.

In looking over the nerve supply of the various vital organs one is led to inquire who can interpret the nerve factor of any? In attempting a solution, difficulties at once arise. To interpret, all the organs must be taken into account. Imperfect knowledge of nerve supply and office, imperfect interpreters, etc., are some of the difficulties we meet. But this much is certain: The nerves are the lines of communication, near or remote. Sever those lines and communication is at an end. Suppose, instead of cutting the lines, we so obstruct as to break the connection. The result is the same, though slower. In the lungs there is the motor and sensory fibers of the pneumogastric. We inhale or exhale, forcibly or otherwise, as we choose. In health it is a matter of volition. Sever or obstruct one or both of the nerves controlling respiration and the breathing

is laborious, or under control no longer. In disease of this nerve, respiration is not a matter of volition. We may will to breathe deeply or otherwise, but have no power to execute. The same or similar condition maintains if the brain or ganglia on the nerve trunk be diseased. The telegraphic connection is stopped or is not under perfect control.

Again, we inhale something that irritates our lungs. We cough persistently, even though we desire to stop. No doubt it is the little tell-tale ganglia on the nerve filaments of the bronchial tubes that are kindly telling us of the irritation. We are admonished in this way to remove it. If the nerve filaments or ganglia be diseased the irritant may be present, yet we are not conscious of it. But mark—*the injury entailed remains the same.*

Having tried to make plain the central and peripheric nerve influence, let us now consider the essentials to perfect aeration, and at the same time study the defects that cause abeyance of atmospheric influence. We do this the more cheerfully, for on this topic, it seems to the writer, there is gross ignorance and a degree of mental hebetude inconsistent with civilization.

There is a period of growth or development in all existence. We see this on every hand. The human system is no exception to this law of creation. The number of years allotted to man has been variously estimated by different writers. It seems that, while there is a general average of life, there can be no law that will apply to every individual. Each human being has a life distinctly his own. As no chain is stronger than its weakest link, so no being is stronger than his weakest organ. When we see a race, family or individual prone to a certain disease, we can account for it on no other than rational principles. There can be nothing accidental regarding it. It must be due to heredity or causes external or internal. If due to heredity, by following up certain family lines or connections, we find the same disease. If, as we trace this disease back, we find it more or less prevalent or malignant, we make deductions accordingly. These are generally correct.

There is a tendency on the part of some to speak of heredity as a sole causal factor in diseases showing transmission. This seems a mistake—an error that needs correction. Should a parent have lung disease, should his children to the latest generation have the same disease at birth, one could reasonably attribute all disease of like nature to heredity. Observation does not confirm this statement. A parent with diseased lungs, or lungs of abnormal tissue, may transmit weak lungs, or, probably better, lungs of abnormal tissue. Observation shows this to be true. Both parents having weak or diseased lungs this claim is doubly sure. Of either parent, the mother most certainly transmits the weakness, as I have elsewhere shown. This, then, seems a law of heredity: *Like transmits like.*

Why certain mental or physical characteristics or conditions, etc., are transmitted may never be fully explained, but their transmission *cannot be denied.*

Is there another factor that aids heredity? Suppose a cause be shown for the lung disease already spoken of. Suppose this cause is constantly at work. The following would then prevail: Abnormal lung tissue from parentage plus the common cause—nothing preventing—*a progression that would depopulate the earth.*

This, I think, is the exact condition we find in tuberculosis. Tuberculosis is a systemic or constitutional disease, due to a common cause, viz., abeyance of atmospheric influence. A tuberculous parent transmits a tuberculous tissue. A child of a tuberculous parent is prone to tuberculosis. Placed in a condition of enforced suspension of atmospheric influence he will assuredly die of tuberculosis: placed in an opposite condition, he probably will die from other disease. Tuberculosis has one cause—*one alone*—abeyance of atmospheric influence.

What evidence have we of this? The best evidence of cognizable facts: The evidence of our senses—intellectual perception.

In what does a subject of the tubercular dyscrasia differ from the healthy or normal subject? In nothing, so far

as known; only in proneness to tuberculosis. The tubercular dyscrasia seems a systemic taint that weakens the entire human fabric; a poisoned system in which a harmful element is not eliminated; a system lacking in one essential—the oxygen of the atmosphere; a system that may be restored to the normal, through the generations, by *observing natural law;* a system destined to premature disease and death without invoking the aid of this law.

In the whole realm of disease can an analogous one be found? Disease, like facial expression, is similar, yet dissimilar. No two faces alike—a similarity in all. Syphilis and tuberculosis have many similarities.

What is abeyance of atmospheric influence? Simply suspension of atmospheric influence, imperfect aeration, lack of ventilation of the blood. Can it be made more plain? This may arise from causes external or internal, or combined. The air we breathe contains certain essential elements in relative proportion. This is normal air. Should one in health breathe air that deviates from this standard it would eventually lead to disease. In other words, the disease would be induced by suspension of atmospheric influence. This suspension does not take place from external causes alone. Should one with abnormal lung tissue breathe normal air, it would be just as truly an abeyance of atmospheric influence as in the former case. *The result would be the same, though the conditions be changed.* We have, then, abeyance of atmospheric influence from external and internal causes.

Now suppose, further—and this supposition is not an imaginary one—that the two conditions be found at the same time in the same individual, viz., abnormal lung tissue and abnormal atmosphere. What would result? Disease doubly certain, and that, it may be, *in the absence of the bacillus.* This disease would then be induced by combined causes. In the opinion of the writer, the major part of tuberculosis is so induced.

Let us now consider severally some of the so-called predisposing causes of tuberculosis. It will be seen that what-

ever the ultimate result, abeyance of atmospheric influence explains the primary condition. By primary condition is meant the state of the patient *before the entrance of bacilli.*

CONGENITAL DEFECT.

Children are brought into this world by the vicious, overworked, etc., without object or aim. They are cast upon society as helpless waifs, a burden to mankind. It were better had they never been born. Without particular disease, they fall an easy prey to any. This is the congenital predisposition of some writers. It is seen where numerous children are born of the same mother in rapid succession. The parents may be healthy, but the period of rest is so short the children do not receive a requisite vitality. Children of this stamp readily succumb to any epidemic or epidemic disease. Is it any wonder multitudes of these children die of tuberculosis? Would it not be a greater marvel that any lived with so unfavorable a birth and environment? Puny in development, with narrow and contracted chest walls, the air space for perfect breathing is not sufficient. Born perhaps of scrofulous or tuberculosis parentage, the lung tissue is abnormal, and, as shown, there must be a consequent abeyance of atmospheric influence. Add to this an unfavorable environment, meaning by this absence of proper care, sunlight, clothing, etc.; add still further, an impure atmosphere, and you have a condition favorable to the entrance of bacilli. Do the bacilli cause the disease? *By no means.* They simply enter the tissue as a feeding ground. As the vulture and dead animal are found together, so likewise the bacilli and diseased tissue. *It is the condition of the system that allows the bacilli to enter.*

HEREDITY.

So much has already been written on this topic that it seems superfluous to write further. This much is certain: Parentage in the race of life does tell. The nearer perfect the health and environment of the parents the nearer per-

fect the child at birth. The greater the deviation from the normal in parentage the greater the deviation from the normal in offspring. When writers tell us all are born alike, and that the differences in mankind are wholly due to bent of inclination, environment, etc., it seems the sanity of the writer should be called in question. To think the child of the debauchee an equal competitor with the child of the upright is contrary to reason and common sense.

OCCUPATION.

Another predisposing cause of tuberculosis is found in the vocation of the individual. In those trades or callings where the rooms are crowded or where the air space is not sufficient, the death-rate from tuberculosis is sensibly increased. Here it is abeyance of atmospheric influence from without—impure air. In those trades in which the air is filled with irritant dust, which comes in contact continually with the air cells of the lungs, the death-rate from tuberculosis is largely increased. Here it is abeyance of atmospheric influence from within, due to the irritant in the air. The lung tissue actually becomes thickened and diseased before the bacilli are found. Change of occupation frequently effects a cure. Again, we sometimes see the two conditions combined, viz., insufficient air space and an irritant dust. In these cases the death-rate from tuberculosis is still higher. Here we have abeyance of atmospheric influence from combined causes—lack of air space and the irritant dust. Suppose the person so exposed be a subject of congenital defect, or the tubercular dyscrasia. We would then have the maximum death-rate from tuberculosis. In all cases it is a suspension of atmospheric influence in the primary condition. Thus in an enumeration of disease in which tuberculosis seems to invade secondarily, it will be found abeyance of atmospheric influence is always present.

To summarize: The requisites of perfect aeration are normal lung tissue, correlation of force, and a pure atmosphere. The predisposing causes of tuberculosis are: Congenital defect, heredity and occupation. The primary cause

of tuberculosis is abeyance of atmospheric influence, induced by external, internal and combined causes.

It is seen that tubercle bacilli perform a secondary rôle in the great tragedy of tuberculosis. This is the conviction of the writer, after years of careful research and observation.

ANNOTATIONS.

"The tubercle bacillus not being inherited, but passing into the body from the outside, how does it get there? Under what conditions does it exist there? Under what conditions does it pass from the outside to the inside of the body? Under what conditions does it live and propagate there? It is impossible to demarcate the answers to these questions as clearly as the questions themselves."—(Jas. B Russell, B.A., M.D., LL.D., Senior Medical Officer of Health, Glasgow. Republished by permission by the State Board of Health of Massachusetts, 1896.)

As seen in the preface of the pamphlet from which this extract is taken, "The subject is so clearly expressed and so admirably treated that the State Board of Health, with the consent of the author, has decided to reprint the principal portion for popular distribution."

We have, then, an eminent health officer writing on a subject which concerns us all, and asking under what conditions the tubercle bacilli enter the system and propagate or grow. At the same time he positively affirms no answer can be made as clear as the question itself. The writer thinks differently.

The scholiast recognizes five methods of obtaining information, viz., observation, reading, listening, conversation, meditation. Suffering has also been added. We briefly call attention to two or three of these methods.

(a) Observation. Cast your eye over the field of animate nature. Observe closely they who have tuberculosis and they who have it not. All belong to one of two classes, there is no middle state. Observe the manner of life of these distinct classes. No nomad, no wild animal has the disease. Among the civilized and the domestic animals the disease is found in every case.

Note yet further. All civilized people and all domestic

animals do not alike have the disease. Some take it while others escape. Why do not all take the disease? Why do any escape? Observation again points the way. None have tuberculosis except they in some way have suspension of atmospheric influence. No suspension, no tuberculosis. To apply this truth clearly it is observed there is more than one way in which suspension of atmospheric influence takes place. They who think suspension means simply breathing an atmosphere in which there is less oxygen than normal have only a superficial view of the situation. Suspension means more than this. We use in brief a chart as heretofore published:

- From without
  - Impure atmosphere
    - Ill ventilation, vocation, etc.
  - Impoverished atmosphere
    - Over-heating rooms, improper ventilation, etc.
- From within
  - Defective lung tissue
    - Original
      - Heredity.
    - Acquired
      - Disease, exposure, etc.

Observe the monkeys in the forest. Tuberculosis is unknown among them. Place these monkeys in confinement and suspend atmospheric influence in one of the many ways, they die of tuberculosis. Avoid the suspension, the monkeys live. Observation affords a lesson.

In "Boots and Saddles," when Mrs. General Custer sees, in the great Northwest, the cabin and tepee side by side—the one unoccupied—and asks the reason, the ignorant Sioux expresses a truth for all time: "I have a cough when living in the cabin." The Sioux knows nothing of germs, but he does know the cause of the cough and avoids it. Did he know the virtue of ventilation he could live in the cabin as tepee. The civilized man knows of the germ, but regards nothing else and dies of the cough. Which is the wiser? Civilization has many lessons yet to learn. One lesson may be learned of the untutored savage. None is more important. Will he learn it?

To speak clearly, there is a condition of system which allows the entrance of the germ. This condition is produced by suspension, which is caused in many ways as enumerated. In this there can be no mistake. When Dr. Russell declares it is impossible to demarcate the answer as clearly as the question, he is mistaken. The mistake can be shown by putting a test question, *i. e.*, by taking a healthy animal and causing suspension—*the germ at once takes root and grows.* This test may be made in the many ways of suspension. In this test the law of tuberculosis is verified. This law is founded in fact. Of this truth the writer is so assured he challenges controversy.

Why is the Indian in the ill-ventilated cabin subject to cough, while the Indian in the tepee is immune? The reason is simple. *It is the condition of the Indian that allows the bacilli to enter.* This condition is produced, in his case, by ill ventilation. Nothing is more certain. Could it be otherwise?

In the writer's judgment there is no question but that the advent of civilization was the advent of tuberculosis. Must we then go back to nomadic life in order to rid ourselves of this dreadful scourge? By no means. All that is necessary is to recognize the cause of the disease and remove it. Nothing further is required.

(b) Reading. "When the bacillus obtains access to the body of a warm-blooded animal, which it almost solely does by the great main entrance, the mouth, passing thence into one or other of the diverging channels, the windpipe and the gullet, it is not yet in a physiological sense inside the body. It must break through the mucous surfaces of these passages. This is a most important stage in the career of the bacillus from a preventive aspect," etc. (Dr. Jas. B. Russell.)

When a fire on the hearth or in the furnace is kept within its metes and bounds and its gentle warmth is diffused to every part of the house there is no danger from conflagration. The house is not yet on fire. *The fire must break through the roof and windows of the building.*

This is a most important stage in the career of the fire from a preventive aspect, etc. There is a close analogy between the bacillus and the fire. The bacillus in the windpipe or stomach is as fire on the hearth or in the furnace. So long as either remain there, no danger is experienced. When either leave, the one to grow, the other to consume, each becomes an element of danger. Neither can be dangerous so long as the machinery is intact. The writer thinks it becomes the good tenant in either case to attend to all needful repairs. Herein he thinks the bacteriologist is at fault.

The writer desires to be honest when he asserts that all the bacteriologist attempts to prevent is the entrance of the living germ into the healthy system. This is laudatory, but unnecessary. Living germs do not enter the healthy system to harm or destroy. It is the unhealthy system alone they harm. When a system becomes unhealthy from suspension then the so-called germ enters and propagates or grows.

The bacteriologist asserts, no germ, no tuberculosis. The germ is wholly at fault. The writer says not so. There is another fault which can be prevented, and in this way the disease can be controlled. The fire is not at fault. The fault is in a defective flue or fire-box. So, the writer believes, the bacillus is not at fault. The fault lies in the defective organism in which the bacillus thrives. As stated, this defective organism is induced by suspension. This may be shown at any time, by direct experiment. Why not make it?

It seems our present knowledge is inaccurate or at fault. The tubercle bacillus is spoken of as a parasite. It is a parasite only in the sense that it propagates or grows in diseased tissue. A true parasite attacks or attaches itself equally well to the healthy or diseased organism. Not so the tubercle bacillus. To examine more closely the latter part of Dr. Russell's statement—"This is a most important stage in the career of the bacillus from a preventive aspect."

Two constructions may be placed on the above. Or, perhaps, better, the above may be considered from two standpoints:

1. It is truly an important stage. It is the commencement of the second stage of tuberculosis, and if the disease be not controlled at this point in all probability it will not be controlled at all. Certainly this is very important.

2. In another sense it is not so important as may seem on first sight. The patient has been ailing for weeks or months. The bacillus is now about to enter his system and grow. Why wait these weeks or months? Why not prevent the disease during this long period? Why wait until the last moment? Suppose the firemen of your village or city should hear the alarm of fire. Would you have them wait until the flame bursts from the roof and windows before attempting to extinguish the same? Would it not be better to stop the fire at the earliest moment? Why not apply this truth to tuberculosis?

Physicians are called poor collectors. Certain it is many die in poverty after years of toil. Is not something else lacking? Do not physicians lack common sense in the application of truth? The writer is inclined to think so. If our reading is to be of avail in the betterment of mankind, we must examine and digest what we read and truly make it a part of ourselves. Without this we are the mere puppets of erudition, nothing more.

(c) Meditation. "The bacillus is not inherited. As regards pulmonary consumption, this statement may be taken as absolutely true. The bacillus *may* pass from a tuberculous parent into the body of the fetus, and be born with it; and thus the offspring may carry into independent life a tuberculous process, but this fact has merely an academic interest. Tuberculosis has been actually seen in the fetus with just sufficient frequency and certainty to prove that the inheritance of the bacillus is not impossible. For all practical purposes, the hygienic administrator is bound to regard every case of tuberculosis as caused by infection, which has taken place, so to speak, in the open, within the sphere of his control."—(Dr. Jas. B. Russell.)

He who observes must ponder or meditate, else his ob-

servations will be common as of the multitude. Apples had fallen since the days of Adam, but it was Newton alone who discovered the law of gravitation. He simply *thought about* the falling apple. He who reads must digest or assimilate, or his reading is of little avail.

The fact that a tubercle bacillus *may* pass from a tuberculous parent into the body of the fetus truly has academic interest. The truth that tuberculosis or the growing bacillus is actually found in the fetus is of greater interest and has wider range of application. One can readily conceive of a plant organism passing into the blood current of the mother and thence to the fetus. The finding of a *growing* bacillus in the same fetus is of wider significance. It is thought worthy of our closest attention. *It is proof positive a soil preceded the growing plant.* How came that soil? The hygienic administrator sees nothing in this. "He is bound to regard *every* case of tuberculosis caused by infection." This statement seems truly marvelous in the light of facts: (1) No germ takes root in health; (2) in every case a soil precedes the growing plant; (3) the tuberculous parent transmits a soil. It is seen: No infection can take place unless there be a suitable soil. But the tuberculous parent transmits a soil, hence the hygienic administrator is bound to regard *every* child of tuberculous parentage. Yet more, he is bound to regard every tuberculous marriage. When we consider a soil is produced in one way, and must in every case precede the growing germ, it is high time the hygienic administrator recognizes this fact and acts accordingly. No such recognition or action will be taken so long as he firmly believes the germ theory of tuberculosis. Let us at once and forever discard this theory. Mankind will receive a marked benefit.

DUTIES OF THE HOUR.

To see ordinary duties postponed from time to time when they should be discharged at the moment is a sad commentary on human life, but such is seen at man's best estate. "Procrastination is the thief of time." A worse condition is often observed: Urgent work is neglected and the time occupied with things of a trivial nature.

This procrastination or putting off the essentials while superficialities engage the attention is a common fault and is due to many causes. Foremost among them is a lack of thought. The child at school who idles away the time instead of getting the lesson is doing this very thing—a lack of thought. In after years the thoughts come thick and fast when there is little time for reparation. So in manhood we often take up those subjects which are truly least beneficial, and find in old age we have wasted our time and substance for naught.

The medical man is subject to the same fault and gives way to the same weakness. How often we observe the carefulness of procedure in seeking out a so-called germ, in establishing its habitat and means of propagation, and then giving way to a childish method of disease communication and suppression!

In no disease is this seen more clearly than in tuberculosis. By erudition and a painstaking accuracy it is determined that a plant or bacillus is found in certain conditions of the system, that in these conditions a disease is commonly present, known as tuberculosis. Without further care or thought it is at once assumed the disease condition is caused by the plant or so-called germ. Nothing is more foolish. A plant growing in a certain condition is no evidence the plant causes the condition named. It simply shows a live plant has found a favorable soil. This favorable soil may be found or determined in two ways: (1) Natural selection or affinity; (2) transference.

Illustration: Mr. A. plows a field and weeds spring up in every direction—natural affinity. It may be one or more particular kind of weeds are found growing. Mr. B. plows a field and sows one or more kinds of grain. A transference is here seen. In the two cases the soil is similar, the sowing dissimilar, the fruitage or growth is like or unlike. The distinction is in the method in which the plant or seed becomes rooted in the soil, *i. e.,* natural or artificial. In other words, the distinction is the way in which tuberculosis becomes seated in the system. *The soil is alike in both cases.*

On this and on this alone hinges the worth or littleness of our knowledge in tuberculosis. On this and on this alone must be estimated the merit of infection or contagion. Is tuberculosis infectious or contagious? Is the soil favorable? Weeds or seed do not grow unless the soil be favorable; neither do germs.

Disease extension in tuberculosis is seen on every hand. Why? Its cause is wrongly interpreted. Disease suppression is nowhere to be seen, or at best only in isolated cases. Why? Present methods are utterly insignificant. First grasp the true cause of tuberculosis, then act, not *talk* of disease suppression.

It may be asked, is not tuberculosis less prevalent now than it was a few decades ago? The disease seems less prevalent, but this is due not to our greater knowledge of germs and avoidance of them, but rather to a better method of living, in that we have more commodious dwellings, take more exercise in the open air, etc., etc. Advance further in this direction and the condition of the people will be yet more marked.

Our knowledge of germs has done little if anything *per se* in combating the ravages of this disease. That this statement is true every acute observer will plainly recognize. We see a natural and a selective affinity in the daily vocations of life.

Milk, on standing in the open, becomes acid or sour. We are told that this is due to the presence of germs. Please

observe: Conditions of the atmosphere hasten the changes that occur. May it not be that the condition of the atmosphere prepares a suitable soil? Is this not probable? Must it not be so? If not, why should milk turn quicker in some atmospheres than in others?

If the milk be hermetically sealed no change takes place. Science tells us this is due to the exclusion of germs. Certain it is, the milk thus sealed is not subject to the atmospheric conditions. It is seen there are two ways to prevent the changing of milk: (1) Select the atmosphere; (2) hermetically seal. The first is difficult. The second is readily performed. Hence the sensible farmer or dealer in milk adopts the second.

Take the lesson we learn from the action of milk and apply to the human system.

In our daily rounds we meet multitudes of people who have, in one form or another, the disease known as tuberculosis. Some have placed the proportion among the civilized as large as three-fourths of the entire number of people. The writer thinks this an exaggeration, but it will be admitted that the exact number who have the disease, though large, is hard to estimate.

Present science says the disease is caused by a germ, known as the tubercle bacillus. The writer denies this, but admits that in many cases of the disease this germ is found growing; in other cases the germ has not taken root. The disease may be in an incipient state, and all that is lacking is a favorable soil. So soon as the soil be favorable so soon is found the growing germ. A person in this condition may be compared to milk standing in the open. If the atmospheric conditions be favorable the milk turns sour, or the germ takes root. In the individual the growing bacillus is added to the already serious disease. The ailment then takes upon itself a two-fold nature, viz., *the prepared soil and the growing plant.* Herein the germ theorist is sadly at fault. He regards not the dual nature of the disease, and directs his energies to the germ alone.

The writer believes the average germ theorist to be

germ proficient and common sense deficient. Knowledge is power, but common sense should be used in its application.

It will be remembered there are two ways to prevent the change in milk. There are also two ways to prevent the germ's entrance and growth in the system. To hermetically seal the milk works admirably. Could we hermetically seal all avenues of entrance of animal life no doubt it would work equally well, so far as the germ's growth is concerned, but this cannot be done. Neither can we practically build germ-proof houses in which to live. One alternative yet remains. We can control the soil in which the germ thrives. In other words, we can control the atmospheric conditions which cause the favorable soil and thereby control the disease. This is certainly worth knowing. Its attention is a duty of the hour, an essential which should be regarded at once. Knowledge of this truth makes it reprehensible in us if we do not take heed to its teachings.

What is one of the superficialities? The tweedledum and tweedledee of germ infection and immunity. Immunity is a myth, infection an impossibility with an unfavorable soil. *He who allows or causes a soil to become favorable should be held criminal before the law.*

This may seem serious talk, but in so insidious and deadly a disease as tuberculosis there should be no whitewash or red tape. All teaching should be plain common sense.

An elective or selective affinity is seen by the good housewife in making bread. Yeast is prepared and at a proper stage of the proceeding is transferred and thoroughly mixed with the flour dough. The ferment causes the dough to rise, and in this way the enlarged or aerated loaf is obtained. This measure is one of convenience. The dough would naturally ferment or rise if the atmosphere conditions be favorable, but the action would be slow, erratic or irregular—hence the artificial transfer. What is the dough at best? Only a favorable soil. What is the yeast? Multitudes of growing germs. The germs placed in a favorable soil at once take root.

Here is a lesson in bacteriology. Certain cultures are procured in a similar way. Starch solution or beef bouillon is used as a media and germs are propagated in these. Now because cultures may be obtained to the fourth or fifth generation is no evidence the culture causes the media. The media is procured. The germ is procured. They are simply placed in continuity under favorable conditions, and *the one affords nourishment to the other.* The germs develop or grow. This is a simple but truthful explanation.

It is marvelous to what straits the germ theorist is reduced in talking of these things. According to him the germ is all in all. *It is no such thing.* The germ is only one factor, the media another, and the conditions a third. The one who rationally talks of tuberculosis must bring in three factors: Media, condition and germ. If he talk of germ alone he is one of the foolish virgins, and will soon borrow oil or be left in darkness. The present age is one of advance. Let us march forward. Tuberculosis can be controlled and the world should know it. Did I say can be? It *is* controlled and the world should know the way. The author endeavors to give it; accept in this spirit.

We see an illustration of selective or elective affinity in the experiments made in the bacteriological laboratory. Cultures as above made in beef bouillon are transferred to the animal kingdom, as the guinea-pig, dove or rabbit. Upon inoculation with these cultures it is found, generally speaking, that they continue to grow and the animal dies of a disease similar or like the one from which the original germ was taken. This is assumed as proof positive that the germ so found is the cause of the disease. Let us not be too hasty in our conclusions. Assumption in every case is not found to be truth.

We stated three conditions are necessary in order to have the transfer or artificial removal a success, viz., media, condition and germ. The germ selected is, of course, a live or proper one. The condition is of the live animal, warm and moist, the most suitable. The media must afford nourishment, else the plant would not thrive. What more do we

wish? What does the experiment prove? Simply that plant growth will thrive in the live animal, or under varying circumstances. Does it prove that the germ causes the disease? By no means. In the first place, live animals, in their normal condition, in the open air, never have germs growing in their system. The placing of them there is an artificiality. If naturally, in health, they do not enter the system and grow, how can we establish that the artificial insertion is the natural cause of the disease? Such reasoning is unworthy the school boy. Yet such reasoning passes for science.

A short time since the writer was invited by his friend, Dr. Dudley P. Allen, to walk through the various apartments of the Lakeside Hospital, Cleveland, Ohio. Among others he pointed out the rooms for microscopical and bacteriological experiments. I saw in little crates or cages. doves, rabbits, guinea-pigs, etc., and thought in passing, here is an artificial condition for natural entrance of germs. The transfer made in the laboratory, like the transfer made by the good housewife, is an artificial one of convenience. It is more speedy. But in either case it proves nothing except germs thrive and propagate in a variety of media. When will we learn wisdom? Certainly we have not as yet.

For a natural entrance of growing germs there must be a prepared soil. Whether we prepare the soil ignorantly or wisely, the germ alike takes root and grows. If we prevent the formation of soil, we prevent the growth. Here is the true secret of all tubercular disease.

Tuberculosis is a disease of civilization caused by suspension of atmospheric influence, in that the suspension prepares the soil for vegetable growth.

The disease is governed by the following law: The death-rate from tuberculosis is in direct ratio to suspension of atmospheric influence.

What, then, are the duties of the hour? To prevent suspension in every conceivable way.

A CATECHISM.

What is tuberculosis? A constitutional disease dependent largely on the evils of civilization, and governed by the following law: The death-rate from tuberculosis is in direct ratio to suspension of atmospheric influence.

Do not standard medical writings tell us tuberculosis is caused by the germ tubercle bacillus? Yes, they so inform us.

Is not the consensus of medical opinion, as found in those writings, more likely to be correct and of consequent greater worth than individual opinion? Yes, this is true as a general proposition.

Why, then, should one persist in saying tuberculosis is caused by suspension of atmospheric influence? Every one as a witness should tell "the truth, the whole truth and nothing but the truth."

We are witnesses. As such, must we agree with the multitude or tell that we know? The upright judge would say, *"Tell that you know."* Again, no body of men is infallible. Because the multitude say a statement is correct is no reason it is so.

Is not the presence or absence of tubercle bacilli in the tissue an evidence of the presence or absence of tuberculosis? Listen to an authority: "The tubercle bacillus is ubiquitous."

Is not a growing bacillus in one's system an evidence of tuberculosis? Yes, but the growing bacillus implies a precedent state. Without this state the bacillus does not grow. The tubercle bacillus is not found growing in the healthy system.

The question now arises, which is the primary cause of tuberculosis, the precedent state—suspension—or the tubercle bacillus? Look around you! What takes precedence, the growing plant or the soil in which it grows? *In every case, the soil.*

Which is, then, the primary cause of tuberculosis? One answer: The soil—the precedent state—or suspension of atmospheric influence.

Having determined the primary cause of tuberculosis, let us now proceed.

Mr. A. has tuberculosis. Mr. B. has the precedent state. Will the writer please tell us the difference in these cases? Mr. A. has the precedent state plus the growing tubercle bacillus; Mr. B. has the precedent state. Messrs. A. and B. each have tuberculosis.

Tuberculosis may exist in the absence of tubercle bacilli, but can never exist without the precedent state. Herein lies the error of the *savant* Koch. He has mistaken the cause of tuberculosis. His attention has been directed alone to the germ tubercle bacillus.

Tuberculosis is not caused by the tubercle bacillus. It is due to suspension of atmospheric influence, is based on law and can be controlled.

To be clearly understood, the writer makes tuberculosis more comprehensive. The term includes:

1. All cases in which the growing bacilli are found.
2. All cases in which the condition of the system is such as to allow the tubercle bacilli to take root. Should we classify:

First stage, prior to entrance of bacilli—subject to control.

Second stage, after entrance of bacilli—amenable to treatment.

Third stage, breaking down of tissue—treatment of little avail.

Having shown the plant growth is a secondary condition or modifying influence in this most fatal disease, we would now call attention to modern treatment as directed against this growth or supposed cause. We do this the more willingly feeling assured this treatment must ever be barren of permanent curative results, and at times dangerous to the patient.

What is tuberculin? As first given the public, tuberculin is a glycerine extract of tubercle bacilli cultures.

Judging from observation, of what use is tuberculin? Largely commercial.

Has tuberculin value? Yes. Illustration: Mr. A. has tuberculosis, as ordinarily defined, *i. e.,* the precedent state plus the growing tubercle bacilli. Here it has value. That there be no mistake in this matter, we quote no less an authority than Prof. Jas. T. Whittaker : "The value of tuberculin in the diagnosis of the disease in cattle is universally accepted. According to the report of Salmon, thus far we have yet to meet the first case which reacted and did not show tuberculosis upon post-mortem examination."—Lancet-Clinic, Sept. 11, 1897, *i. e., tuberculosis as ordinarily defined.*

(a) *Tuberculin determines the presence of growing bacilli.*

Today, as then, these words are true. All tuberculin determines *is the presence of growing tubercle bacilli.* Hundreds of cattle stand in their stalls with the precedent state. Thousands may likewise stand in favorable conditions to produce this state. Of these tuberculin says nothing.

This leads to another question, has tuberculin value in diagnosis? No. Illustration: Mr. B. has the precedent state, *i, e.,* tuberculosis as defined by the writer—no growing bacilli induced by suspension of atmospheric influence. (Please observe Mr. B. has the symptoms of tuberculosis as found in the first stage of the disease.)

An injection of tuberculin is made; *no reaction.* What does this injection determine?

(b) *Tuberculin has no value in diagnosis*

But if there be stages in the disease tuberculosis, the first designated by absence, the second by presence of growing tubercle bacilli; if tuberculin determine the presence or absence of these, is not the extract useful?

When the writer remembers the first stage is subject to control, the second simply amenable to treatment, this fact appears valuable should we possess an accurate means of

determination. It is known to every practitioner that tuberculosis in its first stage is difficult to detect. The stage being determined, the physician knows for a certainty the result to expect from treatment—a very valuable acquisition.

Can we with certainty differentiate the first stage by means of tuberculin? No. Illustration: Mr. C. is sick and calls on his physician. The symptoms simulate malaria The blood is examined; no plasmodium found. A tentative injection of tuberculin is made; no reaction. What does this determine? *The absence of growing bacilli.*

It has been shown that growing bacilli are absent in health. They are absent in many diseases. The mere absence of growing bacilli does not determine the first stage of tuberculosis; therefore:

(c) *Tuberculin has no certain value in differentiation of first stage.*

Is the use of tuberculin dangerous? Yes and no. Illustration: Mr. D. is ailing. He has symptoms of incipient tuberculosis, or the precedent state. He has reason to fear tuberculosis in the first stage, for his occupation and manner of life are such as to induce this state. He asks his physician, who is a noted bacteriologist, if there be any way to determine whether he has tuberculosis or not. The doctor replies, "The science of medicine has made rapid advances. When you were a boy this could not be determined. Now it is as simple as A, B, C. Dr. Koch deserves the gratitude of mankind." An injection of tuberculin is made; no reaction. The patient is assured: "Your fears are groundless; no tuberculosis whatever." (It must be remembered the precedent state is the condition of the system in which the living tubercle bacillus takes root.)

What is the actual result? Mr. D. passes rapidly from the first to the second stage of tuberculosis—from a curable to an incurable condition.

What are the actual results? Mistaken diagnosis, loss of confidence in the physician, death of the patient.

(d) *Tuberculin is sometimes dangerous.*

True, the patient is dead. Can it be shown tuberculin

is the cause of death? Has not Prof. Whittaker told us he has used tuberculin every day in hospital and private practice for six years, in now nearly one thousand cases, and has never seen any kind of evil result? Does not Prof. Koch say in substance that tuberculin is perfectly innocuous? Why decry tuberculin?

That there be no misrepresentation we quote from the published writings of Koch, as translated by J. T. W. (Lancet-Clinic, April 24, 1897): "Only the most extremely virulent cultures should be used in the preparation of TR . . . They must be prepared as fresh as possible . . . I consider it out of the question to produce TR in large quantities with the hands . . . . At my suggestion, apparatus for wholesale manufacture has been provided."

Listen to what follows concerning Prof. Koch's new tuberculin: "In regard to TR, it has been subjected to much criticism, both on account of the failure in some hands to obtain hoped-for results, and on account of the impurity of some of the samples that have been sent out by the firm that have been allowed by Koch to manufacture this product for the market." Again: "According to Trudeau and Baldwin, some tuberculosis bacilli may be found in the preparation." (Bulletin of the Pasteur Institute, July, August and September.)

After reading the above it seems further comment is unnecessary.

Is tuberculin dangerous? No, if perfectly pure and injected with proper precautions.

To summarize: The injection of tuberculin determines the presence or absence of growing bacilli, is of no value in diagnosis of tuberculosis, of uncertain value in differentiation of first stage of the disease, and is sometimes dangerous.

It is seen from the above that the intrinsic value of tuberculin is small, while, under existing circumstances, its commercial value may be great.

What of tuberculin in treatment? When Prof. Andree launched his balloon in search of the pole he began a peril-

ous journey; result unknown. So when one promises cure of disease not understood, he is traveling—no one knows whither.

What is a constitutional disease? The word constitutional is significant. When that prince of cynics, Thomas Carlyle, took a walk for the good of his health, he spoke of it as a "constitutional"—conveying the idea, as the writer thinks, that physical exercise in the open air builds up the entire system.

When one speaks of a constitutional disease he means a systematic ailment that primarily is taking away or destroying the life or vigor of the entire organism.

The word constitutional is used in contradistinction to local. Should one in the prime of life gradually decline in physical and mental vigor, we properly designate this a constitutional disease. Should one have an ailment in one part or member of the body, we properly designate this a local disease.

In medicine constitutional and local are relative terms used to point out the extent of invasion. If applied to treatment they respectively represent the whole or part of the system for which the remedies are taken or applied.

From the very nature of the case, when one has a constitutional disease he frequently has local symptoms. *Per contra* when one has local disease he frequently has constitutional symptoms.

Our system is so connected and complex, one part being dependent on another, that when one member is diseased the entire system suffers; when the system is diseased individual members suffer in a greater or less degree.

These remarks may seem commonplace. They are common language used to make plain the nature of a constitutional disease.

The writer takes it, a constitutional disease is a disease of the entire organism, and that primarily.

Is tuberculosis a constitutional disease? On this, as many other subjects, writers fail to be lucid. If we attribute the diseased condition found in tuberculosis to the

action of the germ tubercle bacillus alone, as is the common sentiment of the medical profession to-day; if the tubercle bacillus capture and kill its subjects, as a fox a lamb in the open, tuberculosis may be regarded a local or infectious disease. The writer is unwilling to accord so potent an influence to the plant.

We are told one takes tuberculosis as he takes measles, etc. The inception of tuberculosis is a question of exposure. As the majority of mankind have measles at some period of their existence, so the majority have tuberculosis. As some do not "catch" measles, so some do not "take" tuberculosis. This seems very simple.

Is this view strictly correct? Let us examine this subject a little more closely. The tubercle bacillus is a plant growth. Like all vegetable organisms, the plant must have a soil in which to develop. True, the soil for the vegetable growth is found in a living animal, but please observe the soil *per se* is a dead or partially disorganized tissue. Must it not, of necessity, be so?

Science tells us that plant life can assimilate only the simplest forms of food; that tissue of the living animal is food not in its simplest form. Therefore, the living tubercle bacillus *per se* cannot take root in the living animal. Hence, a soil must be prepared before the reception of its host.

For an author to state that tuberculosis is caused by a germ, and is received in the same way as measles, etc., is, to say the least, an expression of ideas with little reflection. The method of infection in measles and tuberculosis is very different. Is it necessary to prepare a soil for the inception of measles? Can we in any way so prepare a soil? Is a soil prepared in every case of tuberculosis before the bacilli can take root? Yes, in every case. Can we so prepare a soil? That we can must be evident to every observer.

Illustration: Take a number of monkeys from the forest. In their natural state tuberculosis is unknown among them. Place these monkeys in confinement, with proper ven-

tilation, for a few days. It will be found that not some but *all* have the precedent state or soil necessary for the growth of tubercle bacilli. It will be found in a short time that not some but *all* have tuberculosis.

In an exposure to measles some few escape; not so in tuberculosis, if the soil be prepared.

It may be asked, does not confinement *per se* aid in the production of the precedent state? This is answered most emphatically in the affirmative.

We have shown suspension may take place from within or from without. We have shown that exercise in the open air prevents the precedent state. To now speak of confinement as an aid to the precedent state seems superfluous. Confinement or lack of physical exercise must, of necessity, be an aid in its production.

One writer says tuberculosis is a disease of the nervous system. He reasons: In every case of tuberculosis the nervous system is involved.

Another might say tuberculosis is a disease of the muscles, for in every case the muscles are wasted.

A third might say it is a disease of the osseous system, etc., etc.

The truth lies here: Tuberculosis is not a disease primarily of any one isolated system, but is a constitutional disease. As such it includes everything in the physical make-up of the organism. The truth of this assertion can be verified by any observer or pathologist.

Let us for the moment lay aside the idea of germs and calmly consider the pathological condition as found. One has phthisis pulmonalis—tuberculosis of the lungs; another, tabes mesenterica—tuberculosis of the mesentery; a third receives an injury, an amputation is performed, and tuberculosis develops in a partially healed stump, etc., etc. It is seen the pathological condition is found in many organs of the body. While one organ—the lung—has a pre-eminence in this regard, yet the fact of finding tubercle in every organ would lead one to suppose a constitutional dyscrasia preceded the pathological condition. In other words, that

tuberculosis is a constitutional disease before the formation of tubercle.

Why one organ is predisposed in one individual and another in another is perhaps due to an innate weakness of that particular organ.

It is generally found that when tuberculosis of one organ causes death, the evidence of the disease is not local, but systematic, showing a condition of system preceded the local condition.

But, say some, "How can these things be?" Does not the bacteriologist inject tubercle bacilli cultures into the healthy living guinea-pig, and do they not grow? Why should one say a soil must be prepared?

Another question: "Do these bacilli naturally grow in the tissue of the healthy living guinea-pig?" Is not the method of injection an unnatural method? In seeking natural results why not use natural methods? For tubercle bacilli to grow in a natural or spontaneous manner a soil must be prepared.

Let every biologist in the land take this truth to his laboratory and ponder it in his heart. Let him ponder with the slide of his microscope intact. Then will he truly learn the science of life.

What is meant by civilization?

"An improved condition of man resulting from the establishment of social order in place of the individual independence and lawlessness of the savage or barbarous life. It may exist in various degrees; it is susceptible of continual progress."—(Guizot, translation by Hazlitt.)

Do we understand civilization has evils?

As Guizot has put it, civilization is an improved condition. Let no one assume the life of the savage is equal to the life of the civilized. A just comparison places savagery far in the background. Should any doubt this let him compare the condition of woman in the two stages of existence. In savage life she is the menial of man, subject to his caprice; in civilized life his equal in every regard. Nowhere

to-day do we see the savage exalted except perhaps in poetical effusion.

The author quoted tells us civilization exists in various degrees. For example, the civilization of the United States in 1897 is not the civilization of Spain for the same year. There is an immense difference.

Again, civilization is susceptible of continual progress. No nation or people have, as yet, arrived at an ideal of civilization. As the Methodist brother puts it, "We must go on unto perfection."

If civilization be not yet perfect, evils must exist. To what particular evils does the writer refer?

Only to those which cause suspension of atmospheric influence, or the precedent state. In other words, only those which cause tuberculosis.

What is one of the most flagrant evils of civilization?

Ill ventilation: (a) In the home; (b) in the workshop; (c) in the public hall or conveyance.

(a) The writer's attention was called to the remarks of some poor immigrants: "What lovely homes! Do the people own these? How did they get them? In our country no one owns homes except the rich." A sad commentary on European civilization. Will it ever be so in America? The bulwark of strength in our land to-day is the home. Churches may rise and fall, nations come and go, but the home is sacred and should remain. To the home we are attracted and tied.

In building the home or temporal structure in which we live, mankind is fallible. We build too large or small, or not in accord with the laws of nature or of health. We build each after his own model or ideal, and our houses differ as our judgment. "Each thinks his correct." As misplaced confidence in marriage wrecks the happiness of the earthly home, so building ill-contrived or ill-constructed houses wrecks the happiness and health of those who in them dwell.

In obstetric practice we are often called into homes in which the bedroom or sleeping apartment is the smallest

room in the house. This is a mistake; it should be the largest. In close apartments the air is breathed and rebreathed many times during the night.

In the selection of a furnace or heating apparatus mistakes are made. Furnaces, in general, are too small. The furnace should at least be double the capacity required in cold weather. There is then no white or red heat of the furnace to abstract oxygen. It has been already shown that impure or impoverished air causes suspension of atmospheric influence or the precedent state. Herein lies the secret of the so-called infectiousness of tuberculosis.

Tuberculosis is never infectious in a pure atmosphere. Tuberculosis is ever infectious in an impure atmosphere.

What is the lesson taught? To ever keep the atmosphere pure.

To summarize: Each resident in America who builds a home builds as best suits his judgment. In construction little regard is paid to ventilation. This is perfectly natural, for present teaching seems to be how to render the home germ-proof.

(b) In one sense our work-shop is our home. One is an attorney, another a merchant, another an artisan, etc. Each is engaged in his vocation a certain number of hours per day. For these hours his shop or office is his home. The laws of health apply as in the home. The ventilation and heating should be on the same principle—an abundant supply of pure air.

To the artisan in his shop there is an element of dust or vapor with which he must contend. This increases the danger from tuberculosis in that it increases the suspension of atmospheric influence from without.

Who has not observed the increased death-rate from tuberculosis in the artisan? Have you ever thought this increase was due to excess of germs in the little shop in which he works single-handed? In the writer's judgment, the increased death-rate is not due to excess of germs, but to suspension of atmospheric influence from without. The germs then enter.

In the larger shops there are often three factors at work at one and the same time: (1) Insufficient air space, consequent rebreathing or air impoverishment; (2) poor ventilation, to prevent draughts or to keep out the cold—therefore, impure air; (3) the irritant dust or suspension from without. Add to these, heredity, low vital resistance, etc. Is it any wonder multitudes thus placed readily succumb to tuberculosis?

Please look at the question from a rational standpoint. Would you think a disease thus caused could be prevented or cured by other principles than those of common sense?

What would be a teaching of common sense? (1) Abundance of pure air; (2) elimination of the irritant dust; (3) all workmen with an hereditary taint excused.

What is present teaching? (1) Artificial immunity—injection of tuberculin; (2) prevention of infection—cuspidors partially filled with water, into which all workmen are taught to spit. The comparative merit of the two methods of prevention is left to an intelligent profession.

(c) The people who continuously dwell in close houses, who assemble in close public halls and churches, are the civilized. The people who continuously suffer most from the dread disease, tuberculosis, are the civilized. These two statements must ever be borne in mind.

Of civilization and tuberculosis, which precedes the other?

In one sense there is no precedence. Where we find the one, there we find the other also. Civilization and tuberculosis, like twin sisters, walk hand in hand. In point of time there is precedence.

Civilization has evils. Civilization must exist before evils develop. In this sense civilization precedes the evils and the disease rapidly follows—cause and effect—the one shrouded in the mysticism of the ages, the other plain as the noon-day sun.

Can nothing be done to avert the calamity that has fallen upon us as a civilized people?

So long as students in medicine are taught that tuber-

culosis is due to a germ; that immunity may be secured by injection of tuberculin, so long there will be no true progress in prevention and control of the disease. So soon as we grasp the true or primary cause of tuberculosis—suspension of atmospheric influence—so soon we take the first step in prevention and control. *There can be no definite action until there is clear apprehension.*

Perhaps no great nation of the earth has better intercommunication than the United States. A famine in our land would be well-nigh an impossibility. One wishes to travel; he has only to select his route and trains pass and repass by day and night at his very door. It seems perfection.

Did you ever think of the inconveniences of travel? We refer more particularly to the irritant dust or smoke of the cars; of the close and vile air contained in them. Have you ever experienced these? The same inconveniences of travel are found on many crowded thoroughfares of our large cities. Day by day we see every available space taken. Standing room is at a premium, for in standing one occasionally gets a breath of fresh air as the door is opened.

To what danger are we exposed in these closed coaches and assembly halls? Suspension of atmospheric influence —the precedent state—incipient tuberculosis.

Does not the danger consist in infection from the germ tubercle bacillus? As already stated, *infection cannot take place unless one has the precedent state.* This state is induced by suspension, avoided by breathing pure air.

What, then, is the preventive?

An abundant supply of pure air.

The way to cure disease most speedily has long been sought in the practice of medicine. Human judgment is ever at variance as to method, a clear indication that no perfect way has as yet been found.

One thing the present generation has taught us: The necessity of prevention. In this regard no century of history can show a brighter record. We are entering the portals of a millennium. God hasten the illumination.

Truly, who can cure tuberculosis? No one. Who can prevent the disease? Only he who understands its cause. The study of causal conditions in tuberculosis should therefore be our highest aim. Let us ever keep this thought in mind.

In how many ways is suspension of atmospheric influence induced? Suspension may take place from within or from without. From without through impure or impoverished atmosphere; from within through defective lung tissue, original or acquired.

When is an atmosphere impure? An atmosphere is impure when it contains a mechanical or chemical irritant. In grinding on an emery wheel, or in certain vocations in stone work, etc., the dust irritates the lungs, or collects on the mucous surface, and thereby suspends atmospheric influence. The same suspension is found in vocations in which the irritant is a gas or vapor, etc.

When is an atmosphere impoverished? When, from over-heating of rooms, improper ventilation, etc., the oxygen in the air is less than normal.

How does impoverished atmosphere produce suspension of atmospheric influence? A certain amount of oxygen is necessary at each inspiration to properly aerate the blood. If oxygen be deficient in the air the respirations must be hurried, or else the blood is not aerated. Imperfect aeration is suspension of atmospheric influence.

A careful study of the death-rate from tuberculosis will show it is largely increased in cases of suspension of atmospheric influence from without.

To what extent is the death-rate increased? In proportion to suspension of atmospheric influence. Let us see if this be true. Here are two men doing like work in the same room. One dies of tuberculosis, the other continues at his work. Why this marked difference?

1. Heredity. If heredity and environment be the same, like results could be anticipated, not otherwise.

2. Home life during non-working hours. If the same, like results.

3. Vital resistance. Mankind are not born alike in power to endure; if so, there is inequality in vital resistance.

If heredity, home life and vital resistance be the same, we should expect similar results. At the same time, whatever the comparison, it will be found that suspension of atmospheric influence induced the precedent state. Without this there could be no tuberculosis.

What is meant by defective lung tissue? The word defective is used in its ordinary sense. If a limb be defective it is in some way weakened or deformed; if a fruit or growth be defective it is not perfect. So in lung tissue. Defective lung tissue is not perfect, does not perform its normal functions. The function of lung tissue is to insure perfect aeration of the blood. If this tissue be inflamed or thickened it is defective; if it be permanently thickened or if it be of abnormal tissue, its function is weakened or destroyed.

A lung tissue may also be impaired temporarily or permanently. This impairment may be due to heredity or acquisition. If to heredity, one is responsible for results only as to using the one talent aright; one talent is all that is granted. If to acquisition, one is responsible not only for the right use of the talent remaining, but also for the loss of the many talents bestowed.

Profit and loss are seen in life as in business. Should we recklessly throw away our God-given faculties there is no one to blame but ourselves. If we use and strengthen those granted us, it is all a reasonable creator could ask or creature desire.

To any who closely study disease it is seen that the offspring of defectives are defective. It is also seen that one cannot recklessly throw away a treasure and at the same time have it.

To those who study tuberculosis it is seen that children of tuberculous parents are generally tuberculous. It must also be seen that there are certain acquired conditions which predispose to tuberculosis. In a tuberculous offspring there is original defective lung tissue—suspension of atmospheric

influence, the precedent state. In other cases, as in measles, pertussis, etc., there is an acquired defective lung tissue—suspension of atmospheric influence, the precedent state.

To recapitulate: The precedent state or incipient tuberculosis is caused by suspension of atmospheric influence.

- Suspension of atmospheric influence.
  - From without
    - Impure atmosphere
      - Ill ventilation,
      - vocation, etc.
    - Impoverished atmosphere
      - Overheating rooms, improper ventilation, etc.
  - From within
    - Defective lung tissue
      - Original: heredity
      - Acquired
        - Disease
        - exposure, etc.

The law of tuberculosis expresses it more tersely: The death-rate from tuberculosis is in direct ratio to suspension of atmospheric influence.

There have been many solutions of the sphinx-like riddle, tuberculosis. The writer thinks the above will stand all tests.

Let us resume our catechism. Why should measles and pertussis be placed in the category as causing acquired defective lung tissue and pneumonia left out? It is true, tuberculosis sometimes follows pneumonia. The writer is inclined to think pneumonia more often supervenes upon an unrecognized incipient tuberculosis. The pneumonia runs its course and then tuberculosis, at this stage, is diagnosed. To answer the question more direct: in measles the rash covers the entire surface, cutaneous and mucous. During the eruption suspension of atmospheric influence must take place. The eruption disappears, but sometimes leaves an inflammatory thickening in the lungs. This causes continued suspension of atmospheric influence, or the precedent state. The bacillus then enters and takes root.

A double pneumonia is fatal. Lobar pneumonia usually involves but a portion of one or both lungs. While this portion is involved the rest of the lung acts perfectly,

but, of course, respiration is quickened. Hence no suspension. The disease is of short duration and recovery is perfect.

In pertussis there seems to be a continued inflammatory action, which leads to thickening—suspension or the precedent state.

Observation shows tuberculosis often follows the above diseases. The explanation given seems the most sensible and comprehensive.

It is fabled when Methuselah was 500 years of age, an angel awoke him and said: "Arise, Methuselah, get thee up and build thee a house, for thou art yet to live 500 years."

The reply of Methuselah is characteristic of a man in the prime of life. Said he: "If I am to live but 500 years why should I build me a house?"

Whether the age of Methuselah be taken in a literal sense or not, this much is certain: Life at present is shortened in years.

Whether Methuselah lived in the open his entire sojourn or not this much is certain: The present manner of life shortens our years.

What is a common cause of tuberculosis? Let us examine. If the animal kingdom be taken as a whole we find two classes: They who roam at will and they who are subject to the will of another. Or perhaps better, they who of necessity take physical exercise in the open air and they who from choice, or otherwise, do not take such exercise.

Of the former class, we find all wild animals and all nomadic tribes, as the aborigines of our country.

Of the latter class, all domestic animals and all civilized people, as the Americans and Europeans of to-day.

Among the former, tuberculosis is unknown. Among the latter no less than one-seventh die of the disease. A marked contrast. Of the wild animals it is verily a "struggle for existence."

One animal is preying on another, so each is on the

alert. If it be not the pangs of hunger that cause exertion it is the fear of having to appease the hunger of another animal.

So physical exercise is a matter of necessity. Activity is life.

It is mainly so of an uncivilized people. The struggle for existence is dominant. The females perform all manual labor, the males are trained in war and the chase. War and the chase are constant occupations. The tribes are constantly moving and live in the open air.

As before stated, none die of tuberculosis. With domestic animals the case is different. The pet cat or pug sits quietly by the fire and lives wholly in the home. They are fed as the family and ofttimes receive greater attention.

The domestic animal is fed and housed as the individual owner. The stabled cow, the penned sheep, the unused horse are treated in like manner.

Is tuberculosis prevalent among them? Yes, and please note the prevalence is in accordance to the law of tuberculosis. The death-rate from tuberculosis is in direct ratio to suspension of atmospheric influence.

Did you ever know of a daily used race-horse dying of tuberculosis?

Do not unused stable-fed horses die of tuberculosis? Why the difference? Lack of physical exercise—suspension of atmospheric influence.

This statement is also true of the work horse. A horse constantly used in the open air seldom dies of tuberculosis. Why not? Because physical exercise does not permit continued suspension of atmospheric influence. Can any one assign a logical reason why tuberculosis is more prevalent in the ox than in the horse? The difference lies in a difference of physical activity.

All things considered, physical activity means prevention of tuberculosis.

In these latitudes there are two conditions which compel mankind to bestir themselves, viz., poverty and riches.

Both are blessings if rightly used.

He who has not the wherewithal to secure the next meal is compelled to put forth effort either to work, beg or steal.

He who has riches is compelled to care for them, or "they take wings and fly away."

The effort put forth to attain these objects is physical activity.

The student of history will observe the immense increase in wealth in this country during the past few decades.

He will also observe this increase is largely in the hands of a few.

Immense wealth brings corresponding responsibility ofttimes not rightly used.

Increase of poverty means increased dependence on those who hold the wealth.

Ofttimes increased uneasiness or dissatisfaction that the difference in the social scale is so great.

Both the rich and the poor need education and moral restraint. They should ever strive to be more agreeable one to the other.

Legislation should never widen the chasm between them: the trend should rather be to close.

These facts are noted:

1. Increase of poverty and riches.
2. Entailed activity.

Upon whom does this activity descend?

The following picture presents: The rich, few; the many, poor; the anxious, careworn parent; the idle or vicious child.

In the home of the rich—superfluity, idleness, etc.

In the home of the poor—penury, vagrancy, etc.

What is idleness?

What is vagrancy?

An answer for both—physical inactivity.

If physical activity prevent tuberculosis, what shall we

say of physical inactivity? Does it not induce tuberculosis?

What, then, is a common cause of tuberculosis?

Physical inactivity.

In what way is physical inactivity a cause?

In that it allows suspension of atmospheric influence to take place in the individual.

Suspension of atmospheric influence is tuberculosis.

What is lacking?

The incentive to labor.

The rich man's child asks, "Why should I labor? There is no need."

The poor man's child asks, "Why should I labor? There is no remuneration."

Physicians, pastors, educators—all, *teach the worthiness and necessity of labor.* It is life.

Say some, "A woman's work is never done."

She suffers most from tuberculosis.

Why educate woman to labor?

Where does woman perform her work?

Usually in the ill-ventilated home.

Does the work cause tuberculosis or is the cause of tuberculosis to be found directly in the ill-ventilation?

In every case in the ill-ventilation.

The work as exercise is the salvation of many a woman.

If, then, the house in which we live—our home—brings so much disease and death, Methuselah was wise in his generation when he said, "Why should I build me a house?"

Is physical culture a requisite in the education of the perfect man?

When the Rt. Hon. W. E. Gladstone in his school days sculled two miles up the river Thames with his college friend, Hallam, he was developing that physical stamina which served him so long and well in after years.

His friend Hallam, in being carried, enjoyed the company, ride and scenery, each in itself a benefit, yet from these alone he received no physical brace or vitality to resist the inroads of disease.

The life of the one proved a monument of achievement in deeds accomplished. The life of the other a monument of worth so soon to pass from mortal view.

Here is a lesson to aspiring genius. Happy the one who clearly reads. The young man or woman who starts in life with a good physical and mental heritage, though poor in purse, should remember in these alone he has a fortune. He should constantly bear in mind this fortune is in his hands for a purpose. That a right use of this fortune strengthens or increases it. A lack of use or abuse of this fortune diminishes it in a like proportion. These truths are seen on every hand.

Two persons of equal age and import start in the race of life. The trysting time is now at hand. The one moves on and accomplishes the cherished object of his life. The other speedily succumbs. Whence this difference? The one has received physical training for the race; he is prepared. The other has made no struggle and is unprepared.

The struggle of existence is the preparation and oft-times determines the man. Physical training is assuredly necessary, let none think otherwise.

In physical culture, what is the primary object? On this, as other topics, writers may differ, but the author takes it physical culture is for the development of the entire man.

Physical culture is used in the training of certain muscles. If life be a foot-race or boxing-match the training of certain muscles may be all that is required. But life is more than these. Life is a complex entity in which there is accumulation, conservation and diffusion of energy. Do not misunderstand. No one of these factors works alone and of its own free will. From infancy to manhood it is largely accumulation. From manhood to old age it is largely conservation. It may be, or it may not be, diffusion all the way.

The primary object in physical culture is to awaken, hold in abeyance and give forth at the proper call. In other words, physical training should include moral and mental

training. He who acquires much in youth has much to diffuse in manhood or old age. He who does not conserve the energy received has no staying power in the continued race, and falls by the wayside. He who best accumulates and conserves has most to diffuse.

The life of each individual may be compared to a dynamo. Electricity is developed, stored and diffused. If the generator be small there is little electricity to store or diffuse. If the storage be small there is no need to develop until ready to use. If the diffusion be faulty there is little use to develop or store. The perfect dynamo has these under control. So the perfect man. Some men have strength —development. Some have staying power—storage. Some know when to give forth—diffusion. The perfect man has each under control.

The historical Samson had accumulation and diffusion —no conservation. Failure.

The college student, Hallam, had conservation and diffusion—no cumulation. Failure.

Gladstone had cumulation, conservation and diffusion. Success.

Perhaps this may be illustrated in another way: Many cannot resist temptation—cumulation and diffusion—no conservation.

Moral training or physical restraint may be necessary. Many, through heredity or defect, have conservation and diffusion, no cumulation. If due to heredity the strong arm of the law should assert its right for the benefit of future generations.

Many have cumulation and conservation, no diffusion. Among this number are the multi-millionaires in health and strength, who acquire and hold but never give. Lazy lumps! What a shame!

The primary object of physical culture should be to render the circuit complete and under control.

Should physical culture be alike for all?

As anatomy tells us the human body at all times has

essentially the same number of muscles, so one naturally infers if one muscle needs training, then all. As the relative strength of these muscles varies with the individual, so one naturally infers the exercise should be adapted to individual capacity. The rule should be: No muscle to lie idle, no muscle to be exercised above a healthy endurance.

Ought physical culture or training be continuous?

The Christian might ask, ought prayer be continuous? meaning, ought the believer to pray once, twice or three times per day during life? The answer would be, "Pray without ceasing." Meaning that at stated intervals the Christian should hold communion with God. The frequency of these intervals must be determined by the needs of the soul. So in physical training. The needs of one's system must determine the frequency or duration of exercise. In eating, one partakes of food when he is hungry. The frequency of eating or amount of food must be determined by the needs of the system. Some people do not eat enough; they starve the body at the expense of the intellect. Others eat too much, so much, indeed, they scarcely know they have an intellect.

With prayer and physical exercise the average man is not apt to overdo. Yet it must be admitted with the physical wage earner there are many, many times when the system becomes exhausted. This should not be. The wage earner should have his periods of work and repose as others. The brain worker should take a certain amount of physical exercise each day, preferably in the open air, the amount to accord with the physical make-up of the system. If the quantity of food ingested be large the exercise should be more active or prolonged. If small, then less so. The brain worker will hold out longer and accomplish more by observing this simple rule. Work or physical exercise is intended for all. There is no exception to it on this earth.

To briefly resume: All should engage in continuous physical culture for perfect development.

What does perfect development bring? Freedom from tuberculosis.

Ought promiscuous spitting to be stopped?

Under a republican form of government all its people are free and equal.

Equal in that each has certain inalienable rights which cannot be abrogated.

Free in that each does as he please, provided he does not displease his neighbor.

As a people we are a nation of spitters. This arises from two causes. The use of tobacco and the prevalence of catarrh.

For the habitual user of tobacco, the writer has little sympathy. For the sufferer from catarrh he has great regard.

"Cleanliness is akin to godliness."

All tobacco users are filthy. It is impossible for them to be otherwise. While there are grades of filthiness, from the esthetic smoker, whose breath at times emits perfume, to the mendacious chewer and spitter, who wallows in saliva, all are filthy.

"Let him which is filthy be filthy still."

In one who suffers from climatic influence, or a constitutional dyscrasia, the case is different. He, too, may be filthy, yet ofttimes it is not a filthiness from choice. The filthiness is thrust upon him.

We are a nation of spitters.

Let him who thinks otherwise enter the crowded church or hall and examine. Let him move through the crowd around the central stove of eating house or saloon, or glance into the cuspidors of the more modern hotel. This, we think, will convince.

Ought promiscuous spitting to be stopped?

In attempting to answer this question there are two things to be considered.

(a) Is spitting beneficial to the one so inclined?

(b) Is spitting injurious to the neighbor?

On the answer given these questions must hinge the oughtness of promiscuous non-spitting.

No tobacco user can swallow his saliva continuously.

He must, in some way, eject it. Spitting, then, in his case, is beneficial to himself. If it be shown spitting is injurious to the neighbor, the oughtness of it should be considered, for no one in health is compelled to use the weed. Its use is simply a habit. To the neighbor who wears long dresses and asks, "Why should I be compelled to endure the nuisance of spitting?" the user of tobacco may reply, "Why should I be compelled to endure the nuisance of trains?"

The one is as much a nuisance as the other.

Should one who views life from a practical or esthetic standpoint ask the same question, no such reply could be given.

The way, then, is plainly open to the tobacco fiend. To at once stop its use or care for his saliva.

On this subject the common law and the law of etiquette should be plain and harmonious.

There ought to be no mistake.

Having considered the status of the tobacco user, let us now consider the rights of the afflicted. His rights, it seems to the writer, have been flagrantly violated in all discussion of the past. At the outset, it may be asked, what right has the afflicted that may not be granted to the healthy? If the healthy have no right to spit on the floor or carpet, in the hall or home, why should this right be accorded to the sick? Let us be candid.

No such right is granted.

Whether in sickness or in health no man or woman can claim the privilege of indiscriminately spitting.

It is a nauseating and filthy habit and should be so regarded by all intelligent people.

At the same time there are extenuating circumstances.

It is to these we would, at present, direct attention.

1. The patient is suffering from climatic influence. He has recently taken cold, or has influenza. He must needs cough and hawk and spit. The patient and his neighbor must bear these patiently. What we cannot amend we must endure. But please observe in every case it is the plain duty of the patient to care for his sputa. He has no

right to place this sputa in any way to inconvenience his neighbor. If so placed, his neighbor has the right to object. This much for the ordinary cold.

2. The patient is the subject of a constitutional dyscrasia. The dyscrasia is a something, not of the patient's volition. Perhaps it is due to marriage, or manner of life of his ancestry—a thing beyond his control. It is the patient's duty, so far as in him lies, to ameliorate or remove this dyscrasia. It is his duty to care for his sputa. Is this all? Has the public no duty to perform? While the public is asking so much of the patient, from a mere esthetic point of view, ought not the public to discharge its plain duty in securing a more healthy generation in the years to come? Why should the public demand so much of the individual in return?

3. The patient has tuberculosis. Laying aside, for the moment, the cause of tuberculosis—whether the germ tubercle bacillus, or suspension of atmospheric influence—laying aside the contagiousness of tuberculosis—whether all or none in health take the disease—ought promiscuous spitting to be stopped? Yes, from an esthetic standpoint.

Assuming tuberculosis is due to the germ tubercle bacillus, ought promiscuous spitting be discontinued from this standpoint alone? No. Tubercle bacilli are found in every atmosphere. If the direct cause of tuberculosis, all would have the disease regardless of sputu.

Assuming suspension of atmospheric influence to be the primary cause of tuberculosis—that no tuberculosis exists without first having this condition or precedent state—ought promiscuous spitting be stopped? No. If suspension of atmospheric influence must be present before tuberculosis can exist—if the ventilation be perfect—what matters it whether there be one or one thousand tubercle bacilli per cubic foot of air space?

In the contagiousness of tuberculosis the writer is insistent. There must first be the precedent state before one can take the disease.

It is not the number of tubercle bacilli in the air, but the presence or absence of the precedent state that determines the contagiousness of tuberculosis.

When one insists that all sputa should be burned or destroyed, from an esthetic standpoint, he is consistent with the facts in the case.

When one demands destruction of sputa on the ground of its becoming dried and mingled in the air, and thereby a source of contagion to the healthy, he is asserting that which the facts in the case do not justify, that which he cannot maintain.

What leads to a belief there is other cause of tuberculosis than the germ tubercle bacillus? The fact that only a portion of human kind take the disease. If the tubercle bacillus be the direct cause of tuberculosis, all should take the disease, for all are exposed.

What other reasons can be assigned? The tubercle bacillus is not found growing in the healthy individual. If the direct cause, the growing bacillus would be found in health.

Is there other reason to confirm this belief? A period of indisposition on the part of the patient always precedes the entrance of the growing bacillus. If the bacillus be the direct cause, this period would be superfluous.

In what way can we determine the presence or absence of this period? By clinical observation and history.

In what way is this period of indisposition naturally produced? By suspension of atmospheric influence.

Can we induce an artificial indisposition which will allow the living tubercle bacillus to enter one's system and take root; if so, in what way? By suspension of atmospheric influence.

If one has this natural or acquired indisposition, or precedent state, in what way can he rid his system of its baleful influence? By physical exercise in the open air. The air is necessary, in that it supplies a long-felt need in oxygen restored. The exercise is necessary, in that it expands

and contracts the lungs, thereby forcing the air into the remotest cells.

Is, then, the open-air treatment of tuberculosis curative? In every case, in the first stages of the disease, *i. e.*, before the tubercle bacilli take root.

Is this truth an important one? The most important in the history of the disease. A knowledge of this truth and its practical application would revolutionize treatment and control the disease—tuberculosis. A truth of such magnitude is worthy consideration. This truth is formulated in the law of tuberculosis.

If, then, we rightly understand the writer, is the oxygen treatment of tuberculosis beneficial? It is beneficial, more especially in the first stage of the disease, *i. e.*, before the entrance of the tubercle bacilli.

Is the oxygen treatment curative? It is never curative in that it does not remove the first cause of the disease, viz., suspension of atmospheric influence. The treatment restores oxygen, *ad interim*, and thereby temporarily builds up the system. The cause of the disease, being constantly at work, gradually undermines the system and results in the death of the patient. Oxygen treatment alone does not cure tuberculosis.

You have spoken of the open-air treatment. In what way is this treatment curative? The living tubercle bacillus cannot enter one's system and grow unless there first be the precedent state. The open-air treatment is curative in the first stage of the disease in that it drives away the precedent state and thus prevents the entrance of tubercle bacillus. With a hereditary taint this treatment must be continuous in order to prevent the disease. Herein is shown the ill influence, in treatment, of the tubercular dyscrasia. A universal marriage law and correct living are the only two methods that will thoroughly eliminate this dyscrasia.

We have hospitals in this and other countries in which the cure of tuberculosis in all its stages by the open-air treatment, is announced; are these statements reliable? It

is a sad commentary on human nature that statistics, like many other things, are modified by the "almighty dollar." But such is the truth. We have professors who are uttering half truths in statistics, year after year; men who have not the vital stamina to tell what they truly know. While we must recognize a difference between the teacher and the thinker, at the same time please reflect—we are teaching a future generation. Men and women are rearing an edifice of knowledge that in future use will be cumbrous machinery. So in the statistics we gather; many of these are senseless verbiage. To return: Tuberculosis is caused by suspension of atmospheric influence. To restore this influence would restore the patient to health, provided there be no destruction of tissue, etc. There are in nearly all hospitals tubercular patients with destruction of tissue, etc.; therefore, but few of these patients are restored to health. Let us illustrate: Mr. A. runs a circular saw; in its use he loses a hand; can any hospital restore that hand as before? Mr. B. has tuberculosis; cavities are discovered in his lungs; can any hospital fill those cavities with normal lung tissue? The age of miracles is past. Why attempt to show the present age a miraculous one? The age is not miraculous. The attempt, if made, is simply a shield in order to more effectually grasp the mighty dollar. Let us be honest.

In general terms, does the open-air treatment benefit tuberculosis? Yes, in many ways (our own classification is used). In the first stage, as already shown, this treatment is curative. In other words, tuberculosis is under control in the healthy subject. In the diseased subject, as in heredity, or in the second or third stage of tuberculosis, it is different. In heredity, a soil is already prepared; if the conditions of life be favorable, the bacillus at once takes root; not so in perfect health; a condition of life may be favorable to the growth of tubercle bacilli, and yet they do not grow. Why? Absence of the precedent state. Again, in the tubercular dyscrasia as inherited, there must be a constant battle to hold the condition of the system at the normal; not so in perfect health. Many flagrant violations of law may occur,

and yet recovery is possible. Is the force of heredity seen?

In the second and third stages of the disease the precedent stage is of necessity present. There are present the growing bacilli, and, in many cases, abscess cavities. It has been shown that the open-air treatment cannot restore lost tissue; lung tissue, broken down, has disappeared forever. What can the open-air treatment do in these cases? Prolong life and afford a small chance of recovery. In all these cases there is still left a small amount of working lung tissue. By the open-air treatment this small amount of tissue is placed at its best; by its proper use, with no incumbrance other than the growing bacilli, the patient is kept in better condition and life is prolonged. Constitutional treatment in connection affords the best results. A good family history with open air and constitutional treatment will restore a share of these cases to health, and in every case will prolong life. In truth, this treatment is the best known to the science of man. At the same time it must ever be remembered prevention is the great field in which to labor. Tuberculosis can be controlled.

Cannot exception be taken to the language used in speaking of treatment? To the followers of Koch, perhaps, TR will rank first; to those having hospitals at command, other systems will continue in vogue. To the one who carefully examines causes and effects, the writer thinks there is but one answer: The open-air treatment is the most potent, if not the only reliable therapeutic agent. The writer has seen consumption recover under open-air treatment without the administration of any drug whatever.

On what is this answer based? Careful observation—to the readers who have carefully observed the old-time homeopathist, of triturations and dilutions, you have seen one thing: The great care used in selecting and arranging the patient's room; the largest room, the one with the most sunlight and best ventilation is the one chosen. The homeopathist succeeds in the treatment of tuberculosis where the regular has failed. Why? Certainly not on account of the medicine given, for flies sip copiously, night and day, from

the dilutions without apparent effect. Why the benefit? On account of the open-air treatment.

Is tuberculosis contagious?

This question is often asked by near relatives, friends and attendants; those who directly minister to the wants of the patient. As a question, it is a perfectly proper one and should be answered in all sincerity.

Before directly attempting an answer, perhaps a preliminary statement is necessary.

Among civilized nations, tuberculosis is found in nearly every locality, is fatal in its nature, and is by some thought to be on the increase. Since the advent of the germ theory of the disease many worthy people have held tuberculosis should be isolated as variola, etc., on account of its contagious nature. These people have even invoked the aid of law to prevent contagion—to protect the healthy.

Is tuberculosis contagious?

The word contagious is used in its ordinary sense. By, is a disease contagious, is meant, is a disease catching?

Can one take the disease from another while staying in his house or room as nurse, or doing the ordinary work of the household? In other words, does one ordinarily take tuberculosis while pursuing these vocations?

Is tuberculosis contagious?

John Smith is twenty-seven years of age, has a loving wife with five small children and the disease tuberculosis. No insurance. Mrs. John Smith is twenty-five years of age, of nervous temperament; does the work of the house, but has heard of the germ tubercle bacillus. Mrs. S. thinks dearly of John, but occasionally thinks of herself and family. Very natural. She consults her family physician, who is a germ theorist.

"Doctor, I am afraid of catching this disease. Is tuberculosis contagious?"

"Madam, your question is a very timely and pertinent one. I have been in attendance on your husband now for about one month. There is no question whatever as to the

nature of his disease. Had thought several times of telling you to be more careful, but I have been busy, extremely busy. Mrs. S., you ought not to enter your husband's room. There is great danger of the tubercle bacilli entering your system."

"But, doctor, what shall I do?

"You ought to hire a nurse at once. A competent and thoroughly trained nurse; one who clearly understands the situation."

"But, doctor, how shall I pay him?"

"Really, madam, I do not know. The law makes no provision."

"Doctor, will the nurse not take the disease? If the bacilli enter my system, will they not enter the system of the nurse as well?"

"Madam, you do not understand. The nurse will take proper precautions."

"Well, doctor, can you not give these precautions to me? Why hire a nurse?"

"You have thus far discharged the duties of nurse. Your work has been done well, yet there are certain precautions that should be observed. All sputa should be burned. The object in this is two-fold: To prevent contagion on the part of attendants and to prevent reinoculation on the part of the patient."

"Doctor, since my husband's sickness I have burned all sputa, as an act of cleanliness."

"As I said before, you must not enter your husband's room. There is great danger."

"Doctor, in what does the danger consist?"

"What a question! In what does the danger consist? The air is full of living tubercle bacilli. The danger consists in these bacilli entering the system and causing tuberculosis."

"But, doctor, does not all air contain tubercle bacilli? Why should I be denied entrance to my husband's room?"

"True, the tubercle bacilli are ubiquitous, but they are not so plentiful elsewhere as in your husband's room."

"Doctor, how many tubercle bacilli does it take to start tuberculosis?"

"Well, really I do not know, but I suppose one or two would be all that is necessary."

"Doctor, I have read there are many microphytes in the ordinary atmosphere. Now, according to your theory, in order to prevent tuberculosis, one would have to stop breathing."

"Madam, there are so many things you must learn from experience. As I said before, you ought not to enter your husband's room."

"But, doctor, how shall I attend to his wants?"

"By means of a telephone. So far as I know, no bacilli travel by wire."

"Doctor, shall I convey his food and clean linen and arrange his bed by telephone?"

"Certainly, madam, certainly."

"Doctor, ought I to wear deceptive gloves while making my husband's bed?"

"Deceptive? You mean asceptic. There are so many mistaken terms in science."

"Doctor, you say my husband's room is improper in that it contains multitudes of tubercle bacilli. What would you say to a larger room with more perfect ventilation?"

"Madam, this is not in accord with approved treatment."

"But, doctor, would not a larger room with perfect ventilation lessen the number of tubercle bacilli per cubic foot of air space? Would it not render the room more fit for a nurse to enter?"

"Robert Koch, the greatest scientist who ever lived, does not treat tuberculosis in that way. He huddles his patients in small rooms. This is approved treatment." (Dr. Hyndman, Cincinnati, O., speaks of the number of patients in a small room.)—Lancet-Clinic in Koch's hospital.

"It seems to me, doctor, that science could yet learn a little common sense. However, so long as you are attending physician, I will obey orders."

"On one condition, madam, I will allow you to enter your husband's room: Provided you wear a mask well padded with cotton wool. The wool strains out the tubercle bacilli."

"Yes, doctor; thank you. I can then look at my dear husband."

"Yes, madam; but you must refrain from speaking."

"In regard to diet, madam, it matters little what you give your husband to eat, provided it be served in the proper manner."

"Doctor, what do you mean by proper service?"

"All food contains tubercle bacilli. The food and dishes should be perfectly clean and all milk sterilized and the dishes placed in the hot oven before and after use."

"Doctor, do you allow butter to your patients?"

"Butter in limitations is quite nourishing. It is used with the usual precautions."

"What do you consider the best way to sterilize butter?"

"Butter should be boiled. It is best eaten while hot through a sterilized tube. There is then no danger of infection."

"Doctor, what shall I do in regard to my five dear children?"

"Madam, I have not read the latest article by Count Von Blaunerhasselt, but I am of the opinion you ought to take unusual precautions."

"Doctor, what would you think of sending them to their grandfather's? He lives on a farm in the country. The children could have abundance of exercise in the open air and plenty of nourishing food."

"Madam, if you value their lives as anything at all, you should do no such thing. To insure safety, your children should be placed in a germ-proof house and the TR treatment commenced at once."

"Doctor, of course I have a mother's fear, but is the TR treatment dangerous?"

"The danger from the TR treatment is now at a minimum, but of course in all cases there is danger."

"Doctor, what is the object of TR treatment?"

"The primary object is to induce immunity."

"May I ask one other question, doctor? What is meant by immunity?"

"There are two forms of immunity, madam. Immunity to tuberculosis and immunity to tubercle bacilli. It is of the former kind I now speak."

"Doctor, do you mean by immunity to disease that one has the disease all the time?"

"No, madam; the very opposite. When one has immunity to disease he never has the disease; he never has the disease so long as he is immune."

"How long does immunity last, doctor?"

"That depends. On an average something more than two hours."

"Well, doctor, of course I am a woman, but this does not seem like immunity to disease, but rather a continuation of immunity."

"As I was about to remark, there is another form of immunity, viz., immunity to the tubercle bacillus. If one should be so immune that the germ could not enter his system and grow, as this germ causes tuberculosis, the person so immune could not take the disease if he desired to do so."

"Doctor, that is just the immunity I desire for my dear children; please explain."

"Virulent living tubercle bacilli are injected into healthy guinea-pigs."

"Doctor, you do not mean to so inject my children, do you?"

"If left alone, in every case, these guinea-pigs die of tuberculosis."

"Doctor, my children are not guinea-pigs."

"If these guinea-pigs are injected with TR in time, the animals do not die of tuberculosis."

"Doctor, you stated the guinea-pigs are healthy. Why have them die at all?"

"As I said before, the germs of disease must be injected."

"Doctor, as I said before, I am a woman. If my babe takes tuberculosis, are the germs of disease injected? Does not a condition of system allow the tubercle bacilli to enter? Does the TR treatment or injection eliminate the condition of system? If not, does it or can it cure the disease tuberculosis? Doctor, please answer my question: Is there not always a condition of system that precedes the natural entrance of the growing tubercle bacillus? If yes, the TR treatment cannot cure tuberculosis."

Is tuberculosis contagious?

Yes, if you have the precedent state.

No, if you have it not.

AN OUTLOOK.

To one who travels the northern portion of our country and sees the bowlders scattered here and there—some large, some small, all rounded as if by gradual attrition and continuous movement—he is led to inquire, whence came these and what cause can be assigned? It was the observation of these and similar data that led to the glacial theory, now generally adopted by scientific men. But what caused glaciers in this latitude? Evidently, it was change in climate, but in the attempt to explain this man is baffled at every step.

Thus it often is in the elaboration of any theory. In science as in religion we see through a glass darkly, and yet we see. To the physician who has sat by the bedside and ministered to the wants of his patient in the dread disease tuberculosis, and witnessed a decline more apparent day by day though steadily laboring to combat symptoms, he is led to inquire, why this dark blot on present civilization and just stigma to medical science?

It is this and similar observations which has led to various theories of the disease. One sees symptoms in tuberculosis which are distinctly nervous, and he declares it a disease of the nervous system. Another, as he travels, beholds germs or vegetable growths in all tuberculous tissue; to him these cause the disease; he at once formulates and advocates the germ theory.

The writer plainly asserts he is not satisfied with either theory. Perhaps it is because he has one peculiar to himself. Some people are built in this way. They are satisfied with nothing unless it conforms to their ideas. Be this as it may, the writer gives his theory gratis, and the reasons are accompanied therewith. What more can be asked? We speak plainly, it is not our purpose to unjustly judge

any theory, but to give as best we may our reasons for discarding the same. In doing this we do not arrogate all knowledge to ourselves, but we speak in order to be clearly understood.

If the disease tuberculosis be of nervous origin on account of the nervous symptoms, why not in the same breath declare it of muscular origin on account of the muscle wasting seen in every case? It seems to the writer this would be just as consistent. One thing medical men should know: An attendant symptom is not necessarily a cause of disease. Every disease has symptoms peculiar to itself. Symptoms correctly observed render the diagnosis clear. But watching symptoms is not determining the cause of disease.

If germs alone truly cause tuberculosis, if the germ be ubiquitous, as most writers claim, why do not all take the disease? Why do any escape? If true, the result is marvelous in the extreme. Herein is the greatest fallacy of the century.

It is assumed that the plant tubercle bacillus is a parasite. *It is a parasite only in the sense of its growing on an animal already diseased.* It never grows on the healthy animal. This was pointed out many years ago and has not been successfully refuted. Where are our living germ theorists? Living germs are abundant.

One thing must be evident to every unbiased mind: A plant cannot grow without a proper soil. Whence comes the soil? The germ theorist assumes the tubercle bacillus grows indifferently in any soil. The writer thinks *this is no such thing.* In every case *the soil must be prepared.* Ofttimes no doubt it is prepared unwittingly, but preparation, as the seed, alike is requisite. This all must learn.

In many ways the soil is analogous to the soil of the farm or garden. As is well known, all soils are not alike productive. Some must be rendered fertile; some need great care in preparation; some are but waiting for the seed. Each soil needs its particular care or attention. This the wise farmer learns from sad experience. So, in tuberculosis as with greatness, some are born great, some achieve

greatness and some have greatness thrust upon them. Some inherit a soil, some acquire a soil and some have a soil thrust upon them. In tuberculosis this may seem strange, startling and discordant, yet it is nevertheless true. It is the discordant note in this disease that renders the harmony more complete.

My attention was early called to law in tuberculosis. What is meant by law? Plainly speaking, law is uniformity of action. Wherever uniformity of action is seen there must be law. Examples: A drop of water undisturbed assumes a globular form—law; the moon revolves around the earth, and the earth around the sun in regular periods of time—law. In the higher mathematics should we demonstrate that planets pass over equal areas in equal times we prove a law. Law is an order of sequence. Should the same thing occur year after year without variation, this is law. My office rent is due every six months. This is the law of the firm. Of this we are conscious. The physician should adopt just such a law, only made monthly, some think weekly.

Laws may be divided or classified as known or unknown. Known laws are accepted without question, or, should they be questioned, may be verified. Unknown laws are discovered like planets, and after discovery may be seen by those having eyes or intellect. "Seeing is believing." They then become known laws.

A word in this connection: To the average mortal mathematics is dry and uninteresting. The writer has a fondness for this particular study. At college in this branch he was excelled by none. Some think mathematics of little value. A distinguished language professor said to his class this year: "All we need of mathematics is to be able to break a five-dollar bill properly and receive the correct change." Is this true? Would it not be nearer correct to speak of language on this wise? "All we need of language is to be master of our own." But we confine our remarks to men writing for the medical profession alone. Allison Drake on "Twentieth Century Medicine a Liberal

Education," in the Colorado Medical Journal, speaks of "the legerdemain of algebra," and "the incapacity of professional mathematicians for dealing with problems of mixed uncertainties as notorious."

The writer thinks if we are truly dealing with problems of mixed uncertainties, the legerdemain of algebra is just in place. But where do we find such problems? In that book of formulas known as analytical geometry, which requires a knowledge of algebra, geometry and trigonometry, no legerdemain or mixed uncertainties are found. Remember, these formulas are used in calculations, as calculus, etc., which are very accurate. "Be not deceived." True, some professionals are so merged in their calling they know little else; this, however, is just as true of musicians, mechanics, etc., as of mathematicians. Let no sane man decry the accuracy of mathematics. Mathematics alone is the exact science.

The truth of the matter appears to be this: Whatever trains the mind to comprehend clearly and reason accurately should be used in the preparatory education of the physician. Mathematics in the training of the reason is transcendent; at the same time he who is most familiar with other languages is most master of his own. In medicine one should alike be master of language and reason.

We said our attention was early called to law in tuberculosis. We also said we are extremely fond of mathematics. In conning the authorities we find no one dies of tuberculosis in the frigid zone. Why? Do they all freeze? No one lives there? Please let this pass at present. We are seeking law.

We put down at once what is given by standard medical authorities. It reads as follows:

TUBERCULOSIS.

Zone.	Death-rate.
Frigid	0
Torrid	Small
Temperate	Great

We then seek reasons for the above and in so doing liberally consult the authorities. It excites one's risibility to think of some of the reasons given. Take the frigid zone in illustration. One author finds as a reason for the zero death-rate in this zone that the people eat a vast amount of fat meat. Hence, the remedy in any climate—cod-liver oil, glycerine, cream, etc. Just reflect one moment. More fat is eaten per capita in the temperate zone than in the torrid, yet the death-rate is larger; so that in giving this reason there is neither law nor common sense.

Another, a germ theorist, finds the reason very simple. The climate is so cold the tubercle bacillus is frozen. Hence the remedy is to cook the bacillus *in situ* and cure the disease in any climate. The writer passes this man by, calling him a *very simple reasoner.*

After long consultation and many sleepless nights we found a something that fills the vacancy. My readers have probably heard of it before, viz., suspension of atmospheric influence. We now fill this vacancy and ask all readers to look:

TUBERCULOSIS.

Zone.	Death-rate.	Suspension.	Ratio.
Frigid	0	0	1
Torrid	Small	Small	1
Temperate	Great	Great	1

Please notice the regularity. Webster says whenever a regularity is traced, law must exist. A law is formulated. In tuberculosis the ratio between death-rate and suspension of atmospheric influence is always constant. We prefer the following construction: The death-rate from tuberculosis is in direct ratio to suspension of atmospheric influence. Take your choice; they are the same. Let us see if this law holds good in its practical application. "The proof of a pudding is in the eating."

The first column, under death-rate, is standard authority, and, so far as the writer knows, has never been called in question. The second, under suspension, is our own,

and, of course, is debatable. Let us see—no suspension in the frigid zone. How do you make this appear? The houses or huts are made of snow or ice. Suspension in such huts is an impossibility. In snow the interstices are filled with air and where there is an abundance of air there can be no suspension; ditto in ice, though not so great. The dry atmosphere of a cold climate keeps the air contained in these meshes or interstices in constant circulation. Writers who have lived in this zone tell us under these circumstances it is impossible for one to take cold. Taking cold, I apprehend, is not clearly understood.

How about small or little suspension in the torrid zone? With few exceptions the life is wholly in the open air. The climate is hot and arid as a whole and permits or allows this. Were the inhabitants of this zone as cleanly, and, in fact, as civilized as in the temperate zone, the writer sees little reason why tuberculosis could not be eliminated entirely.

What reason is assigned for the great death-rate in the temperate zone? In this zone the reasons are multifarious. Our life, for the major part, is an indoor life, *i. e.,* is in inclosed buildings; these are ofttimes but illy-ventilated. Life in the open, at best, is only for a few days in the year. While the fathers and sons live for the greater part in the home, the mothers and daughters live almost exclusively in the home. Vast numbers live in the shops and factories; these are poorly ventilated and filled with dust and smoke. This dust and smoke in the lungs prevents a perfect aeration. Add to this the consumption of gas or fuel which abstracts oxygen. These factors are constantly at work, viz., indoor life, impurities in the air, lessened amount of oxygen. Remember, also, such factors as these: Thickened lung tissue from changeable temperature, etc.; heredity, in that there is deficient lung tissue, capacity, etc.; heedlessness, in that there is ignorance of the true cause of disease. Hence, the great death-rate is caused by great suspension of atmospheric influence.

In December, 1890, the author published an article in

the Cleveland Medical Gazette, in which occurs the following: "Nature controls tuberculosis beyond the polar circles; nature controls in great measure tuberculosis within the tropics. *Nature is doing all she can for us.* Can we help her? I believe we can; that the day is not distant when tuberculosis will be banished from our midst."

A law is given in tuberculosis—as we prefer to call it, *the* law of tuberculosis. The writer is aware this law is an innovation. In medicine as in kindred sciences, innovations arise. We trust this one will lead to a more clear comprehension of this most deadly disease. To the author it is not distinctly new. Fourteen years ago it was written on a blackboard and presented to the Portage County Medical Society. Some of the members of said society are yet living; others have passed to the great beyond. The law is presented in all sincerity. The writer knows whereof he speaks. He is assured.

Notice the working of this law as seen in animate nature around us. No wild animal has tuberculosis. Why? No suspension of atmospheric influence. Domestic animals have tuberculosis. Why? Suspension of atmospheric influence. Of animals dying of this disease, which have the greatest proportional fatality? Those having the greatest suspension. Which the least fatality? Those having the least suspension.

Again, in treatment. What remedy is of most avail in any stage of the disease? A life in the open air—*removal of suspension.* What can be said of incurable cases? *The* suspension cannot be removed.

Notice the law: The recovery in tuberculosis is in direct ratio to removal of suspension.

VAGARIES.

"'But,' I sez, 'can you tell how the little seed of this weed goes down into the earth and selects just what she wants out of the great store-house below? She never comes out in a pink head-dress or a yellow gown. No, she always selects what will make the blue. It shows that it has life, intelligence, or else it couldn't think, way down under the ground, and grope in the dark, but always gropin' just right, always a-thinking the right thing, never, never in the hundreds and thousands of years makin' a mistake. Why, you couldn't do it, Josiah Allen, nor I couldn't. And we set and see these silent mysteries a-goin' on right at our door-step, day by day and year by year, and think nothin' of it, because it is so common. But if anything else, some new law, some new wonder we don't understand comes in our way, we are ready to reject it and say it is a lie.'"—(Samantha at Saratoga.)

The advent of the germ theory of tuberculosis brought with it many vagaries. Some of these have become obsolete, while others are more modern—the old and the new.

The endeavor is made at this time to point out a few of these whimsical notions, wild fancies or extravagant ideas. The object is to touch upon nothing that has distinct merit *per se* without giving the same due credit.

Foremost among these vagaries is, perhaps, the notion the plant tubercle bacillus is a bug, its extract a veritable bug-juice. Who first gave loose rein to his imagination in this regard is unknown. Whether he spoke of verities or uncertainties is unknown. Certain it is, some editors and many writers still cherish these ideas. Associations linger.

The tubercle bacillus is not a bug, but is a plant, deriving its nourishment from the soil. As all vegetation requires a soil, so likewise the tubercle bacillus.

Perhaps this may be best expressed in postulates:

1. No vegetation can grow without a soil.

2. The soil must be peculiarly adapted to the plant.

Of the first, no question will be raised; it is self-evident. Of the second, it is known that certain soils are adapted to certain plants; other soils will not raise them. The wise planter selects the soil by direct observation or experiment; otherwise he meets many failures.

A second vagary is, the tubercle bacillus will grow indifferently in any soil; in other words, as parasites are found indifferently on sickly and healthy animals, so likewise the tubercle bacilli. The outgrowth of this second vagary is due to the common belief that the tubercle bacillus is a parasite. It is a parasite in the sense that it is found growing in the living animal; it is not a parasite in the sense that it is found growing in all animals, regardless of their condition. No tubercle bacilli are found growing in *healthy* animals. A manifest distinction is here made. If, then, the tubercle bacillus be a parasite, *it is a parasite of disease and the disease takes precedence.*

From observation the tubercle bacillus is found growing in a soil prepared by suspension of atmospheric influence. *It naturally grows in no other.*

By experiment a soil may be so prepared and the plant at once takes root. Hence, we conclude there is a law of vegetable growth for this particular plant. As the seed of this plant is everywhere present, as the soil is in various stages of cultivation or preparation, so tuberculosis is seen in various stages of development.

One who takes into consideration only the plant, regardless of the soil, is like the farmer who cares only for the seed. From him the soil receives no attention. To this farmer a small or large crop is equally satisfactory. The ordinary farmer is not so constituted. So we think one should take into consideration the condition of the animal as well as the plant. Certain it is, unless the soil be correct, there will be no growth.

Vagary three: The tubercle bacillus is dangerous. An

early experience in hospitals where operations were performed under a continuous spray, a later experience where patient and instrument were injured by so-called germicides, a still later where no care was taken except cleanliness, makes us somewhat skeptical of injurious germs. But, as the heading shows, we confine our remarks to this particular germ, and assert, if the reasoning thus far be correct, no tubercle bacillus can be dangerous *unless the subject of infection have a favorable soil.* The observation and reasoning along this line have been somewhat curious:

(a) *Historical.*—Many observers of the past have regarded tuberculosis as infectious or contagious. Else why so many cases in one family or community, or nation? Why so universal a disease? *Per contra,* others have regarded the disease simply as a decline, and as attributable to many causes, the family community or nation being subject to said causes. Some trust statistics.

(b) *Statistical.*—At various times statistics have been compiled. The reader can judge of their value. They are gleaned somewhat as follows: Drs. A, B, C, etc., to the number of five hundred, are written and asked to answer the following question: "Do you consider tuberculosis contagious?" One hundred pay no attention to the letter, one hundred and fifty-seven answer in the affirmative, one hundred and forty-three in the negative and one hundred are in doubt. The compiler concludes: "The majority believe in contagion; great care should be exercised." Then follow rules for guidance—when, where and how to spit, etc., etc., etc. Others use reason alone.

(c) *Rational.*—If it be true the plant tubercle bacillus naturally grows only in a soil produced by suspension of atmospheric influence; if it be true we can control, in the majority of cases, the soil so produced, it follows we hold in our hands a method of effectual control of tuberculosis, and that *without germ intervention.* This is the writer's belief.

The germ theorist reasons as follows: If the plant tubercle bacillus causes tuberculosis, there is danger. We must escape or destroy the germ if we would be safe from

the disease. Cotton wool, germicides and serums are in demand.

These same theorists might claim, if tuberculosis be caused by suspension, why shun the danger? One can no more catch the suspension than he can catch a broken limb or a shooting star. The writer claims: True, one cannot catch a suspension, but he can *avoid a suspension and thereby avoid the disease.* This leads to another method which we call:

(d) *Synthetical.*—We may hang our harp on the willow of imagination, yet the most skillful player brings forth only a weird and hollow sound. *We are in a strange land.*

In all logical reasoning we must deal with facts. Let us try to give them:

(a) Tubercle bacilli are everywhere present and cannot be eradicated.

(b) They take root and grow when there is a favorable soil.

(c) The soil is produced by suspension of atmospheric influence.

(d) Suspension of atmospheric influence may be controlled.

This means the control of tuberculosis—nothing more nor less.

But suspension is already present:

(a) From ignorance or neglect.

(b) Heredity, for which we are not responsible or reprehensible.

(c) Disease, to which we are all subject and some time must yield.

Therefore, we must deal with facts as they are, and not as we ideally wish them to be.

We have, then, two entities ever present, viz., suspension or the soil, and the tubercle bacillus or the seed. The soil and seed determine the harvest.

"What shall the harvest be?" The seed cannot be sensibly limited. The output is constant. The soil cannot always be governed. It is sometimes beyond control.

Mankind are truly frail creatures, yet when we once clearly recognize the true cause of tuberculosis and the means of prevention, I am satisfied the above vagaries will be forgotten and the dreadful scourge tuberculosis will be sensibly diminished—the lessening not attributable to anything except a higher knowledge of the disease. Let us labor for this happy consummation. It will abundantly reward us.

MEDICINE.

The field of medicine is an extensive one. Each practitioner, from his particular angle, views to the extent of vision. As when one looks on the lake or ocean he sees as far as he can see, so when one introduces or examines a system of medicine his field is commensurate to the perceptives exercised. No two people see exactly alike. No two have the same perceptives. Hence, the diversity in vision and perception.

As in a coast survey many angles are taken before a complete map is made, so in medicine each should assume many angles before establishing a system. Many of us are extremely narrow. A system should be like the ocean, comprehensive and deep—so comprehensive as to include all knowledge, so deep as not to be readily sounded. A system of similar magnitude demands attention to-day.

Nothing is more evident than that present medicine is beyond the comprehension of any. To some it is neither here nor there—a veritable *ignis fatuus*.

Competent men have declared there is no such thing as medicine, and, to their own satisfaction at least, have proved it. "When Bishop Berkeley said there is no matter and proved it, 'twas no matter what he said." So when the medical nihilist says there is no medicine and proves it, there is no medicine in what he says, and ordinary mortals believe it. A practitioner who gains this idea had better drop from the race. Honestly, he has nothing to do—a disease, but no remedy.

Others declare medicine is uncertain. What is not uncertain in this life? To strike out the uncertain things would not only root up medicine, but law and theology as well. Medicine is far more certain than either. In truth, what could exist? The farmer would no longer till the soil,

crops are so uncertain. The merchant would not cross the ocean or venture in trade, it is uncertain. It is said nothing is certain in this life except death and taxes. These are uncertain in time and magnitude. If we hold fast only to the certain things, poverty would soon be the lot of all.

Say some: Medicine is empirical. The first treatment of disease must be empirical. We know as yet absolutely nothing. We gain our information from observation and experiment. Human nature is full of ailments. Nature's store-house is full of remedies. We seek to determine what will alleviate distress or aid nature in removing disease. Various ingredients, singly or combined, are tried and the results made known. This is empirical. When like results are obtained by a consensus of observers this is then called science in medicine. How else could the value of a remedy be determined than by experiment? How else the worth of a medication than from observation? Experiment or observation at the first must ever be empirical.

As the world becomes older, as disease and remedies become known, we have not only all past experimentation and observation, but also a large field for original research. In this field we are placed as at the first. It is one of unknown disease and untried remedies. So that so long as human nature remains as it is, subject to sickness; so long as the world remains as now, full of the untried, so long there will be the two distinct fields—experimental and practical. These will be taken up respectively by parties best adapted to the work. The separate fields will not long remain fallow or barren. Each will be cultivated and abundant harvests secured.

For the past few years there has been a decadence along this line. This may be attributable to three or more causes:

1. The desire of some to shine in medical literature who closely follow these writers do not see the same results before a proper standard of refinement is attained. They as shown. We must then unlearn what is learned amiss. This retards progress.

2. Experiments on animals are assumed to give identical results as the same experiments made on man. Assumption is not always truth; many times it is the opposite. This we all learn sooner or later.

3. Another fault should be readily seen. Experiments made on the healthy animal are assumed to produce the same result as if made on diseased man. How a rational being could make so logical an assertion is past finding out, yet such seems to be. That similar statements are made may be ascertained by consulting the ordinary textbook in medicine. So many grains of calomel, etc., produce a certain condition or result in healthy dogs, rabbits, guinea-pigs, etc. If given to diseased man we expect similar results. We may expect, but, as a matter of fact, we do not see. Any practitioner knows that Messrs. A. and B. may be alike diseased and a remedy given to the one will not always produce the same result if given the other. Mankind differ in susceptibility both in health and disease. How, then, could we rationally compare the action of remedies in health and disease, much less in animals diverse in nature and habits?

These are among the irrational things found in medicine. There are many others equally as flagrant.

4. As a small observer of the times and seasons, we must also think this decadence is due in part to the dropping of the old and tried remedies and the grasping for the new. This is seen more particularly in the adoption of the various serums in the treatment of disease. It is observed in certain conditions that germs or microbes are found growing. Why they are thus found is not asked, but the conclusion is at once reached that they cause the condition or disease named. How to eliminate or dislodge the microbe is the question for solution—no other. The various methods proposed would baffle the forest hunter in his search for game. A trap, snare or gun would constitute the hunter's outfit. Not so the germ-hunter. He proposes to secure the invader by means of his own extract—a novel method. What is also remarkable, the extract must be of a

certain brand, usually foreign. This certainly appears dishonest. The writer thinks all dishonest methods should be shunned, even though they assume the guise of novelty. Wrong is wrong.

This method of treatment being so contrary to reason, some have tried to rule it out by means of ridicule. But ridicule is not argument. It does not convince. There is one way in which the inconsistency can be properly shown, and that is by comparison. Suppose you discover a drove of hogs in your neighbor's potato patch. What is your first honest impulse? To inform the neighbor. What is the neighbor's impulse? Perhaps to swear, then to remove the hogs, repair the fence and ask for damage. What is the future action? To keep the fence in repair. This is an order of sequence. As a physician you discover growing tubercle bacilli in a patient's lungs, or perhaps, better, a condition of system in which the bacilli will soon enter and grow. You are paid for the discovery. What should be your honest impulse? Should you spend the entire time at the expense and danger of the patient in trying to trap, ensnare or kill the growing bacilli by means of an extract? Should you not act as well, as sensibly, as honestly, by a patient as by a neighbor? If not, why not? Should one spend the entire golden hours of the precedent state, and while tuberculosis can be controlled, in vainly endeavoring to secure a possible immunity to the germ? This is what is being done.

When one looks about him and sees the inconsistency, the foolishness, the dishonesty of his fellows in medicine, he is led to exclaim: "Great God! Can it be possible man is created in Thy image?" Brethren, repair the fence.

Medicine not subject to law! We are accustomed to see things move with regularity and precision. The sun and moon rise and set at regular intervals. Mankind are born, they grow and die. Waters run, smoke ascends, the tide rises and falls. These things we are accustomed to, and of them we take but little note. In medicine things are different. Here there is no regularity. For pain or sickness

one takes nothing, another medicates, a third prays, and all complain. Each thinks his the proper way. Why this diversity? Why not more unanimity? Why not a universal method?

How in regard to theology? One believes in God and prays, another believes in God but not in prayer. A third believes in neither God nor prayer, etc., etc. In truth, we find many peculiar beliefs.

Note this connection in medicine and theology: Nearly all believe in something; the lack, if any, is in unanimity or method. This lack, in medicine, is the one thing of all others which makes the field so extensive. Each has a field. No two fields are alike. A system must comprehend or include all fields. There seems to be no other or better way. Let us enlarge our borders.

DEEP BREATHING VS. TUBERCULOSIS.

One-half of the earth's people are poorly fed. The reason is obvious. It is not that Mother Earth fails to yield her sixty or one hundred fold, but that the hand has been negligent or slothful in preparing the soil or planting the seed.

Prosperity and effort are closely allied. "The hand of the diligent waxeth rich." Indolence has no incentive to labor. As a rule, famine stalks rampant in its fields. India, to-day, is an illustrious example. We note also famine and its twin sister, pestilence, thrive most among the heathen or half-civilized. Christian civilization knows nothing of famine and little of pestilence from personal experience. They are practically driven from its borders.

While we thus exalt civilization of this generation we must also note some of its faults or defects. Foremost among these is imperfect aeration of the blood. A vast majority of the civilized are consuming less oxygen than they should. The reasons are multifarious.

One would naturally think the primary cause for this fault, defect or wrong consists in ignorance of the value of oxygen. The writer is inclined to think this view an incorrect one. The civilized are well informed. That it is not ignorance alone is certain from the fact that physiology is taught in all the public schools, so no plea of ignorance can be raised.

But why is it assumed there is imperfect aeration among the civilized? What is aeration? Aeration is ventilation of the blood as it passes on in the life current. Aeration takes place through the lung tissue. It naturally occurs in no other way. The lungs of man, as the gills of fish, permit the oxygen to enter the system. If the lung tissue be imperfect, thickened, or in any way defective, aera-

tion is incomplete, *i. e.*, insufficient oxygen enters the system.

Should one consume less food than is required by the system, or should the food be of imperfect quality, there is a starvation of the body. The same may be said of oxygen. One who takes in or consumes less oxygen than he should, either from ignorance, perversity or inability, the system must suffer. In one sense it is oxygen starvation or famine.

Should one by deep breathing or inhalation take in more oxygen, or should one breathe a purer air and thereby receive a larger supply, every want in the system is met and the famine is declared off. This is what deep breathing does in certain states of the system. It removes the famine.

But, first, why is it thought there is imperfect aeration among the civilized? One-seventh of all deaths are due to consumption or phthisis pulmonalis alone. If we add to this number others who die of distinctly lung disease, as pneumonia, etc., the proportion seems abnormally large. No such proportion is seen among native tribes remote from civilization. To the writer, the reason seems obvious: They have a more perfect aeration. The perfect aeration of native tribes secures practical immunity from lung disease. Civilization can show no such immunity.

What does aeration accomplish? As the oxygen enters the lung tissue it comes in contact with the venous blood and changes it to arterial. The impure blood is thereby rendered pure. The body, by this means, is kept in a healthy condition. This of itself is one of the essentials to long life. In order to have pure blood our food must be ample in quantity and quality. The oxygenation of the blood is just as essential.

We look on famine-stricken India with hearts of pity and sorrow. Pity, there is so much suffering; sorrow, the people are so unwise and improvident. India could look on us with the same commiseration. The Americans and Europeans are so talented; they have every resource of art, science and literature, yet they are actually dying of starvation—an oxygen famine. The East India men should help

us. No doubt they would had they the zeal and knowledge. The zeal, perhaps, could be attained by a better food supply, the knowledge by the exercise of an acute observation, certainly not by consulting standard authors, who tell us so much of disease germs and their action.

What else does aeration of the blood accomplish? The food we eat sustains us or builds up our system as we digest or assimilate the same. Without digestion and assimilation there can be no true growth or strength added to our frame. To every student of physiology it is known that the lacteals empty the chyle, for the greater part, into the thoracic duct and from thence it is poured into the venous circulation. All chyle passes into this current. It here becomes subject to aeration in its round of the circulation. What does aeration do to this new current which enters the channel for the first time? It seems this is the last creative act, if we may so speak, in the formation of the new blood corpuscle. If so, it must be a very important one in the animal economy. New blood corpuscles are being formed, while at the same time the old are revivified. These two actions are constantly going on during aeration, are imperfectly performed during imperfect aeration, and stop when aeration ceases. It is seen that if every part of the human machinery be intact except aeration there is here found sufficient cause for impurity of the blood and scantiness of the red blood corpuscles. We may give eliminatives, we may ingest a better food supply, we may order *ferrum redactum ad libitum,* but we do not reach the true cause of the difficulty until we establish a more perfect aeration.

Herein lies a secret in the treatment of many diseases. The disease tuberculosis, which is caused, we are told, by the germ tubercle bacillus, originates in this way. The first stage of tuberculosis is simply a faulty aeration. The bacillus enters secondarily—is never a cause of the disease. The faulty aeration may be due to many causes, but the result is one and the same—tuberculosis sooner or later. The remedy lies in the correction of this fault. It may take years to teach this simple truth, but it will eventually be accepted,

and we will look back at the amazing folly of having once thought an infinitesimal germ caused the serious disease tuberculosis. Colorado's burden will then be lessened and the world will breathe freer and easier, with a purer blood supply and an enlightened conscience. It is this field of original research that has remained so long fallow that is destined to yield an abundant harvest on proper cultivation. Let us each, with God-fearing assiduity, sow and reap as best we may and patiently await our reward. It will assuredly come and that with thanksgiving and joy.

We stated the quality and number of the red corpuscles is dependent on the perfection of aeration. Let us see if this be correct as to its practical workings. Take, for example, the ordinary student life at college. Of course, we are aware there is great difference in the student life of to-day and that of twenty years ago. There has been improvement on the social side, larger physical culture, more out-door exercise, etc. In fact, there has been a constant change, and that for the better. Yet, after all, student life is student life—a host of duties, incessant cramming, and for the studiously inclined, but little exercise. Many students are constantly tired, easily exhausted, nervous and irritable. What is lacking? A pure blood supply. Of this there can be no question. What is the remedy? Physical exercise in the open air, more perfect aeration of the blood or hematosis. In the writer's judgment there is no question but that mental and physical training should be conjoined. All schools should be conducted on this basis.

For further illustration take the ordinary housewife, who does, for the greater part, her own work. What is her life? A constant round of duties in her household, never fully done. From early morn till latest eve it is constant, never-ceasing work. "A woman's work is never done." What are her cares? For family, home and self. Self usually comes last. Her wants are many, but her greatest is pure oxygen in her home, or time and opportunity for outdoor exercise. She regards neither, but toils on, a poor, weak, anemic creature, and dies, most often, of phthisis

pulmonalis. Could her untimely death have been avoided? Is civilization in any wise to blame? These are questions the twentieth century will be called to answer. Is not their consideration proper now?

But perchance the woman's sphere is not among the toiling millions. Her life is one of so-called social joy and gayety. It is calls, balls, parties and receptions, of late hours, untimely meals of indigestibles, society's loud call for dress improper, etc. The life, ill-ventilation, etc., cause rising with languor and the noon-day sun. Envy, jealousy and rivalry enter this life, but not more often than imperfect oxygenation of the blood. Society has yet important lessons to learn. Who would dare dictate to fashion?

Maybe the life is that of a wage-earner, and who is not? If so, it is so much work for so much remuneration. We enter not the vexed question whether the pay be sufficient for the labor. This is left to others. The question with us is, is the ventilation ample? Workmen are often crowded; the air space is insufficient and the room is dusty, or perhaps the lights are consuming too much oxygen. The remedy must meet the requirement.

In all these cases systematic deep breathing in the open air will overcome the difficulty if taken in time, provided the fault be remediable. It will benefit the patient even though the cause be continued. But the benefit in the latter case will not, of course, be permanent. Permanent benefit means freedom from tuberculosis.

A question now arises: What faults are and are not remediable? If the fault be not enough oxygen in the room, if an irritant dust, gas or vapor, if a use of the upper air passages of the chest only, due to tight lacing or other cause removable, these are remediable. If by heredity we receive a lung tissue incapable of perfect aeration under the most favorable environment, if from continued exposure, taking cold or other cause we acquire a thickened lung tissue incapable of perfect aeration, these, of course, are not remediable. Deep breathing cannot alter permanently an hereditary or acquired lung tissue. Deep breathing calls

into exercise the healthy lung tissue we possess, and aids the patient in his effort to secure a better blood supply. This alone places him on a higher plane of health and enables him to more effectually resist the encroachments of disease. In other words, one who so acts keeps his system in a condition in which the germ tubercle bacillus does not enter and grow. *He who so acts has a perfect immunity to the disease tuberculosis.* The number of germs in the atmosphere is of little moment *provided there be a perfect aeration of the blood.*

Now please understand we do not advocate deep breathing as a cure-all for every disease. Systematic deep breathing, if the lung tissue be healthy, will insure a pure blood supply in so far as oxygenation of the same is concerned. Oxygenation of the blood, it will be found, is the essential element in the prevention of the precedent state, or first stage of tuberculosis. If true, how essential is perfect aeration in the prevention of the disease! If true, the law of tuberculosis is in direct ratio to abeyance of atmospheric influence.

Deep breathing does more than the oxygenation of the blood. As a preventive to taking cold or the ordinary catarrh it perhaps has no equal. Deep breathing, then, not only prevents tuberculosis directly, but it also prevents the very causes which lead to the same. How essential is deep breathing!

It seems to the writer this article is incomplete until a relation between deep breathing and physical exercise is shown. In one sense deep breathing is physical exercise. In another sense physical exercise is deep breathing. Yet it must be evident to all they are not one and the same. One may breathe deeply with little exercise. One may exercise violently yet breathe shallow. Physical exercise should be such as to cause perfect inhalation and exhalation.

AN AMERICAN NEED.

"A just observation and reflection upon men and things give wisdom; these are the books of learning seldom read." —Wm. Penn.

The Americans as a people are well educated. Many things conduce to this end. Foremost among them a system of common schools prevails throughout the length and breadth of the land—the pride and joy of the nation. The children, when grown, have vivid recollections of these schools. Not only do they remember, but the habit of thought then and there formed follows them in after years. Early life is a period of inhibition; not only so, we also retain what we see or hear.

The child at school may be compared to a sponge. Whatever is presented is readily absorbed, so that, squeeze whenever you will, the child or man gives out that he has absorbed or inhibited. This is a sequel to the present system. Whether it be regarded a fault or not, this much is certain: There is not that in us which tends to a vigorous growth or development. As writers and teachers we lack originality and force. The writer believes this a fault, one that should be corrected, or in some way avoided. It is our life. Wherein does the wrong or fault consist? In this: We take in or assimilate as presented; we memorize and give out just as we receive. Such teaching or instruction develops no originality. It is a parrot-like acquirement and delivery. Ages come and ages go and we roll on forever so.

It is a similar system which has brought the Chinese empire where it is to-day. No people on this earth are better educated than the Chinese. Yet in true progress and clear ideas where are they? One thousand years behind the age. May it never be so said of America.

It is not the object to find fault with a system of education the like of which is not elsewhere to be seen—the rather to commend it. At the same time it must be remembered that all human systems are faulty. To eliminate a fault is to improve the system. Do we desire improvement? Why object to an elimination?

As before stated, in early life the receptive faculties are open. This is as it should be. The child imitates, receives and retains. As yet there is no cultivation of the perceptives. The child sees nothing except through his teachers. As he grows why not occasionally let him look for himself? He passes from grade to grade, and, if studious, becomes an encyclopedia of information, yet destitute of originality —a mere book-worm.

As the best pastor endeavors to find work for each of his parishioners, and thus adds to or improves his talent, so the most capable teacher strives to develop in each pupil his powers of perception or originality. This is wise. Encyclopedias are common. Book-worms are unnecessary. What the world wants is original thinkers for its advancement. The sooner we discover this truth the better for mankind. No discovery is probable by one who has been educated under the present system. The system itself blinds one to original research. It is a continual memorizing of what others have passed on or determined.

That the writer is not giving vent to an hallucination may be seen by observing the high school graduate as he leaves his *alma mater*. Watch him! His unaided ability to secure a position and adaptability to gain a footing in the "struggle for existence" is child-like. He is a mere tyro. Place him on his feet, tell him what is to be done and how to do it, show him what is expected of him, and if he be faithful he learns more of practical worth in one year than in the many years previously. *The world's book of practical suggestion and information is now open to him for the first time.* Is he educated to read this book? We think not.

The same may be said of the ordinary college graduate.

Note the length of time before he finds a place adapted to his abilities. When out of school he is like a landsman at sea. Perhaps he begins with some menial employment much to his distaste, if none other offer. By diligence he rises step by step and from his chaos of information he discovers there is little available at present. The bent of inclination, or more often the solicitations of friends, determines his vocation. All may go well. Very often everything goes ill, or it is rough sailing from the start, and the voyage proves uneventful.

The great trouble is we are made too dependent on some one else. Teachers are not always present. There are some things we must observe for ourselves, else we do not know. Birds and flowers and trees, etc., do not grow with names stamped on them.

To be familiar with these objects we must learn them from nature in nature's school. So in science; science of to-day is not the science of yesterday or to-morrow. It is changing. He who reads science truly must walk as in the day, with both eyes open, *recognizing all men, paying deference to none.* He alone can read wisely.

"A just observation and reflection upon men and things give wisdom; these are the books of learning seldom read." Give us more self-reliance and greater originality; these are potent factors in the world's evolution.

After the classical course in the schools comes the fitting of one's self for professional life—a great work. It is said the major part of our great men are college bred. This at best is saying but little, for all of our children must have more or less of college training. If, then, we have distinguished men at all they must of necessity be from this class.

The question under consideration is, do our strictly college-bred men show marked traits for original research? Are they distinguished along the lines of acute observation? Do they not work in channels or grooves in which they have been taught? Do they not hold and reverence the authorities? Are they not, as a rule, inferior in wisdom to the so-called self-made men?

Our greatest artists have ever copied from nature. Why should we, the students of nature, ever be following the scholastic method?

Let us think wisely, but let us think for ourselves, remembering there are "Sermons in stones, books in running brooks and good in everything."

THE DAWNING.

Within memory of the present writer a health officer declared one dying of consumption should not be carried in a public conveyance unless the casket be hermetically sealed. Reason: The danger from germs is so great the public demands precaution and protection.

Germs, in some localities, are yet considered dangerous —dangerous in that their true action or condition of growth is not clearly understood. We must live and learn.

Thanks to an enlightened public sentiment, the above order is obsolete. Other orders will be obsolete ere long. The light is gently breaking, and soon we will behold the sun in his effulgence. The writer thinks he will bring healing in his wings. Give us light!

For the past two decades we, as a people, have been harassed by the announcement that milk and its products—cheese and butter—are full of tubercle bacilli. We have also, during the same period, been studiously taught that as tubercle bacilli cause tuberculosis, these products are dangerous and should be inspected. A government inspector, as in Germany, has been urged. They say the people should be taxed and microscopists should pass sentence on all milk products placed upon the market. In this way tuberculosis could be controlled. In the meantime, until such inspection, we are advised to avoid cheese, boil butter and sterilize the milk, some even going so far as to counsel the eating of butter while hot through an aseptic tube.

The writer, in his weak way, at various times has denounced these statements as fallacious. In the first place, he argues that tubercle bacilli do not primarily cause tuberculosis. Tuberculosis is a constitutional disease, is based on law and the bacilli enter secondarily. *The constitutional disease allows the natural entrance and growth of the germ.* On this topic the author challenges controversy.

If tuberculosis be a constitutional disease, the disease preceding the germ's growth, milk is a diseased product *before the entrance of the growing germ,* therefore, killing the germ by sterilization would not render it a perfect milk. This was shown by the writer in 1894 (*vide* Transactions Ohio State Medical Society).

If the milk be imperfect, milk products are also imperfect, and *no microscopist could detect this imperfection by the presence or absence of tubercle bacilli in said product.* Microscopical inspection is therefore a useless expense. We pay taxes enough in this direction already.

As stated, the writer has attempted to clear the way for microscopical entities. The replies have not been numerous; in truth, as a rule writers have stood aloof. Is there a reason why? From the hills of New Hampshire we receive the following:

DANGER FROM MILK OVER-ESTIMATED.

"Experiments as well as observations made in the last few years lead us to believe that tuberculosis is much less often communicated to man through milk than was formerly supposed."—New Hampshire Sanitary Bulletin, January, 1900.

A closer observation, we feel assured, will lead to the conclusion that tuberculosis is not conveyed in this way at all, only under certain conditions. These will be spoken of later on.

But who are making these experiments and observations and what is their intrinsic worth? The professors of the United States agricultural experimental stations are largely doing the work. The reports are of value according to the ability, honesty and common sense of the ones making them. Honesty we naturally expect. Some men are downright liars. Common sense and ability, like twin sisters, walk hand in hand. Sometimes they are found alone, but only for short periods of time. They soon come together. They think so much of each other that they are

close companions; nothing can separate. So far as we can ascertain, these men, for the major part, are germ theorists.

For convenience, we divide them into theorists of the first and second waters. Theorists of the first water believe the germ *per se* is all in all. Prof. Robt. Koch and his congeners belong to this class. Men of this stamp believe germs are veritable Napoleons, carrying devastation, disease and death. Theorists of the second water believe there are germs and germicides; also a few other things worthy of notice. Dr. Russell, of Glasgow, Scotland, and Prof. Russell, of the Wisconsin station, are men of this class. They believe germs have a mission, but it is inferior to the mission of the being they infest. In other words, *men are superior to microbes.*

It is a common impression that first-water men are graduates of German schools, while second-water men have not crossed the North Atlantic. This is a mistake. Many first-water men are found who never crossed their state line, while some second-water men have visited many cities of Europe, and *vice versa.* Where one has traveled is of little worth. *What does he know?* This is what the world is asking. This it will ultimately find. One may deceive himself forever. He can deceive the vast intelligence of mankind but for a short time. Deception is short lived.

From the Storrs Agricultural Experiment Station of Connecticut, eleventh annual report, we find experiments were made by feeding eight calves with milk from tuberculous cows, and that without infecting the former. These calves were fed for periods varying from three months to sixteen months without developing the disease. The report is closed in brief, from which we extract the following sensible words: "We know comparatively little regarding the conditions which favor the spread and development of tuberculosis among animals or man." Evidently, the above was penned by a germ theorist of the second water. The second-water theorist knows but little in his own estimation; the first-water theorist knows it all. When one rises to the admission he knows but little, he is in position to take the

first step to obtain more; when one knows it all there is no incentive. He is practically dead and only needs burial.

That little is known, as yet, regarding the conditions which favor the spread and development of tuberculosis among animals, may be seen by consulting Bulletin 108. June, 1899, issued by the experiment station located at Wooster, O. Ohio as a state is in many regards a leading one. The presumption is our men at Wooster are as competent as others. Why not?

"The herd of cattle at this station was established in 1894, by the purchase of a bull and two or three cows, each of the Jersey, Guernsey, etc. . . . At the time these purchases were made the idea was prevalent that the tuberculin test might be injurious to the health of the animal. . . . For this reason the test was not insisted upon, etc., etc. On the station farm they were, of course, given good care, etc. All the increase was retained and by the spring of 1897 there were about eighty animals in the herd, all apparently in perfect health except two—a short-horn cow and a Jersey bull, which had begun to show evidences of disease; the cow by rapid loss of flesh and the bull by the growth in the throat of a visible lump, which caused difficulty in breathing. At the beginning of June both of these animals were killed, after having been subjected to the tuberculin test. The cow was found to be in the last stages of generalized tuberculosis, and the lump in the bull's throat was found to be due to the same disease. A supply of tuberculin was then procured and in December and January further tests were made, and on June 8, 1898, fifteen cattle were slaughtered."—An Outbreak of Bovine Tuberculosis at this Station, p. 295.

Then follow temperature before and after these injections, and the result as found after death—a very interesting report.

These gentlemen should be congratulated. But the writer is not satisfied, in that the report is incomplete. It is incomplete in that the same number of animals were not chosen by the tuberculin test and placed under similar con-

ditions. We would then have two lists of animals, one chosen by general appearance or inspection and one by the tuberculin test. Should the first lot develop tuberculosis we could say, as in this case, it is lack of the tuberculin test in selection. Should the second, after the test, develop tuberculosis, what could we say? *Either the test is inefficient or there is other cause of tuberculosis.* Wihch would it be? The writer asserts that after the tuberculin test tuberculosis will develop, though more slowly. Why?

In the article (Lancet-Clinic, November 20, 1897) the writer held these conclusions:

(a) Tuberculin determines the presence of growing bacilli.

(b) Tuberculin has no value in diagnosis.

(c) Tuberculin has no certain value in differentiation of first stage.

(d) Tuberculin is sometimes dangerous.

The writer holds these conclusions tenable. But our method of experimentation would be along a different line. We claim the precedent state is the first stage of the disease tuberculosis; that this state is caused by suspension of atmospheric influence and is based on law; that suspension takes place from within and from without. Our questions for answer would be as follows:

1. Does suspension of atmospheric influence cause a condition of system that allows the tubercle bacilli a natural entrance and growth? Take a healthy animal and subject it to this test. Answer, yes or no.

2. Is there more than one method of suspension? Experiment on an animal. Answer, Yes or no.

3. Is there an anatomical difference in the lung tissue of health and of heredity, or of acquired influence? Subject the lung tissue of each to rigid microscopical examination or other scientific test. Answer, yes or no.

4. Is there a test chemical, microscopical or otherwise, which will determine the difference in the blood of health and that of suspension of atmospheric influence?

Has science a delicate test? Apply this test to the living animal. Answer, yes or no.

When these experiments have been made and correctly answered the law of tuberculosis will read as follows: The death-rate from tuberculosis is in direct ratio to abeyance of atmospheric influence.

MATHEMATICS IN MEDICINE.

In my boyhood days I taught a winter school in the village of R——. On entering the school building early one morning I found written on the blackboard the following:

$$x + y = z$$
$$x y = z$$

The value of z, please?

A question at once entered my mind. Who wants a solution? Several weeks later I learned a Mr. ——, who had taught in the village, desired one.

Algebra is used but little in medicine, yet the writer thinks its introduction would lead to more accuracy in definition, solve many hard problems and clear up some points now obscure.

In illustration, take the word heredity. What is meant by heredity? The author defines it a prenatal inheritance. Whatever one receives in bone, blood, muscle, etc., prior to birth is by heredity.

Let us see if this be true. Suppose one or both parents have a constitutional disease. Does the definition hold? If not, there is a mathematical inaccuracy. If true, there is heredity in every distinctly blood disease, etc. We quote from "Tuberculosis or Consumption" as follows: "You have a son to send to college. You call before you five leading clinicians in this state and put to each the test question: What factor is heredity in tuberculosis? Listen to the answers: Nothing, little, much, a great deal, all. What arises in your mind? One of two things—either these teachers are deceiving you or else they do not understand the business they profess. *Who can instruct except they who know?*"

But, replies, a germ theorist, if tuberculosis be caused by a germ, which we have every reason to believe; if the growing germ be not transmitted, as experiments seem to show, what matters it whether heredity be much or little? Let us see: "It would seem much easier to formulate a cohesive and rational theory of the propagation of tubercular disease by infection than to account for it by heredity." (Ohio Agricultural Experiment Station, 1899, Bulletin 108, page 364.)

The writer thinks this statement manifestly unfair. Remember, it is a public document, paid for by the great State of Ohio. The present writer has no motive other than the advancement of medical science. He has a right to ask fairness. In what does the unfairness consist? In the ambiguous word heredity. Does heredity mean nothing, little, much, a great deal, all? Much depends on the answer. The majority of germ theorists claim heredity is nothing. In place of heredity put nothing, and then read: "It would seem easier, etc., to formulate, etc., by infection than to account for it by nothing." Not only would it seem easier but *it would be easier*. Of this the writer feels certain.

Who claims heredity is all? Perhaps, all told, about five persons in the United States. To whom, then, is the committee of this experiment station talking? To these five. What does the great majority of the medical profession hold? *That heredity is a factor in tuberculosis—a variable factor. In some cases more, in other cases less.* Refer to history. We will attempt to explain this later.

Now look at the unfairness of the above statement in the light of mathematics. To compare a factor or part with an entity or whole as to the formation of a theory. Manifestly unfair! One thing should be required of all public servants, viz., accuracy of statement, mathematics in definition.

Says the same authority on next page (365): "In discussing the question of heredity we should keep clearly in mind the biological meaning of the term." Exactly. This

is just what the germ theorist does not do. The germ theorist claims the germ grows indifferently in any soil, *i. e.*, the germ tubercle bacillus is the cause of tuberculosis. The writer says not so. A soil must be prepared, *i. e.*, the soil must precede the growing germ. The germ theorist says that heredity is practically zero. The spread of the disease is from the germ alone. The writer says not so. Heredity is a factor. A soil may be transmitted. This soil aids in spread of disease. What is the order of the biologist? Soil, plant, growth or fruitage. Who keeps the biological meaning most clearly? Mathematics in statement is required.

Why is heredity a variable factor? Simply because it does not occur in two cases just alike. Let me illustrate: A father has tuberculosis; his partner in life is in good health; heredity in the child is one factor. Both parents are in good health; heredity in offspring of these parents is another factor. Both parents have tuberculosis; the child in this case is still another factor. The mother has tuberculosis, the father is in good health; the offspring are other factors. And so on *ad libitum* in as many conditions as the parents may be found.

Again, the parents' occupation, environment, etc., cause a variable condition of blood due to perfect or imperfect aeration, and this continued in the parents and transmitted to an offspring cause variation in heredity as a factor.

The great body of physicians in America are as honest and as competent as any physicians on the face of this earth. In saying heredity is a factor in tuberculosis they express a great truth. It is a factor. But we must look yet further. Heredity is not the cause of tuberculosis. The cause is suspension of atmospheric influence. Heredity as a factor aids this cause in the extension of the disease.

Moral: In the prevention of tuberculosis heredity must be regarded in connection with suspension.

A question is now presented to the germ theorist, viz.: Why the diversity of opinion, past and present, in regard to heredity if the germ theory be true? In heredity what is

transmitted? If there be transmission at all there must be an entity.

In order to understand this rightly, one must first clearly comprehend the law of tuberculosis. What does this law teach or show? In every case of suspension from whatever cause, there is first an impurity of the blood due to imperfect aeration. This, if continued, leads to a condition of tissue favorable to the growth of tubercle bacilli. The tubercle bacilli may be ubiquitous, but they are not omniscient. They grow, but they grow as all plant life—in a soil prepared.

Now take this truth and use it in connection with heredity. What is the entity transmitted in heredity? A prepared soil. We have, then, in heredity an identical condition as in suspension at the first. Suspension creates a soil and heredity transmits a soil and they (the soil) are one and the same.

Illustration: Mrs. A. has poor ventilation in her home. She becomes pregnant. During the months of gestation the imperfect aeration continues and it induces an impurity of the blood and a condition of the system or tissue favorable to the growth of the tubercle bacilli. The fetus receives the same blood and the same condition of tissue. Is this clear? This is heredity in the child.

Should tubercle bacilli be found growing in the mother they may sometimes be found growing in the child. In either case, the mother or child alike allow the growth.

Or, perhaps better, let the illustration be taken from life. Mrs. T., of E., has tuberculosis. She becomes pregnant, and in due time is delivered. (I often wonder if abortion in some of these cases would not be justifiable.) The mother having suspension, there is suspension in the child, for, according to the author, in every case of tuberculosis there is suspension. Here, then, we have a babe ready for the growth of tubercle bacilli. In some few recorded cases the bacillus is found growing at birth. Dr. Jacobi, of New York, mentions such a case. Dr. Russell, of Glasgow, says: "These cases have an academic interest," thereby

acknowledging their authenticity. The author thinks they have a greater interest than this. They have a world-wide interest. They prove a soil may be transmitted by heredity alone. Yet there are men in high places who deny to heredity a value, and that before large classes. What astounding effrontery in the light of observation, reason and common sense!

We now hasten to discuss another phase of this question. When a soil is induced by heredity, can it ever be changed back to its original condition? That depends, as in suspension, assuming there be simply a blood change or slight change in the tissue—yes. If the change be to disorganization—no. Destroyed tissue cannot be restored. Again, should there be disorganization with immense numbers of tubercle bacilli, as there usually is, all effort to restore health is in vain. The patient dies. Should enough sound lung tissue remain to insure fairly perfect aeration, under favorable conditions, health may be restored, though not normal.

In what way may this change for the better be brought about? Just reflect one moment. What causes the diseased condition? Suspension of atmospheric influence. What removes the condition? Removal of suspension. The remedy is a simple one: Breathe pure air.

Illustration: We stated Mrs. T., of E., is delivered of a child. What is its condition? One of suspension. The writer stated plainly to the parents the method to pursue. Remove the child at once from the breast, feed it cow's milk and let it have an abundance of pure air. The mother said no—"If I die let the child die with me." Dr. W., of R., is called. He approves my opinion. The mother still says "No." An uncle, Dr. C., of C., is called, and he, holding the same belief, takes the mother to his home and leaves the child under the writer's supervision. In three or four months the mother is covered with the clods of the valley, but that child, to-day a man grown, is in perfect health. At the time of removal it was thought by the trio of physicians that the child would live but a few days. It

had high temperature, colliquative sweats and hurried respiration.

This history is but a counterpart of hundreds of others seen in every civilized land. Do all receive equally favorable results? The writer thinks not.

Let us now return to our analysis of bulletin 108, same page. "The fact that the child of tuberculous parents develops tuberculosis is by no means conclusive evidence that it has inherited the disease in the sense that it may have inherited physical conformation or mental characteristics." The writer confesses he does not clearly understand what the author of the above means. That his own view on this most important topic be clearly understood, the writer again quotes from "Tuberculosis or Consumption": *"Children of consumptives, though the environment be changed at birth, die of this disease among other healthy children born of other parents."*

Example: Mr. B. marries Miss T. Result of union, one child. Mr. B.'s family history is unique. Of the entire family, nine in number, consisting of grandparents, children and grandchildren, all die of tuberculosis, except one child of three, of diphtheria. Miss T. is of good family history, but is delicate. Knowing the above history, the child is taken and reared among other healthy children, yet dies of tuberculosis, aged twelve; the writer being the last attending physician. It seems to the author that in this case an entity was transmitted. Who can determine?

Another question bearing on the above now comes to view. Is physical conformation or mental characteristic transmitted? Common observation shows that it certainly is. This child looks like her father. That child acts like his mother, etc. A likeness, similarity or entity is here seen.

To be more explicit, is the entity of facial expression, etc., as seen in heredity, one and the same as the entity of a prepared soil by suspension? It is not. In the former case it seems to be the result of a natural law or unfolding, whereas in the latter it is the result of a law violation or

suspension. Each is an entity, and each comes under the head of heredity, but neither, so far as known, is controlled by a germ. This may appear strange, but "truth is stranger than fiction."

And now for a bit of experience. "The experience at this station with tuberculosis in swine, given on another page, gives a forcible illustration of the manner in which the disease may even skip a generation, to reappear in full force in the next and yet not come under the law of heredity as above defined."

Benjamin Franklin was pre-eminently a practical man. He said to England, in 1776, that the proper way to eat a large cake is to commence at the edge. The above is a large cake, and we propose to take Franklin's advice. Our nibbling is only at the edge. If the law of tuberculosis be true—and we think it is, ideally, at least—we can skip not only one generation, but five or six generations in succession—*ad libitum*—and reinstate the disease in any generation in less than eight weeks. This may also seem strange, but this in mathematics is called a corollary.

"Again, there is a possibility of prenatal infection from either parent, previously referred to, which would be quite a different matter from constitutional heredity." This is the same old story of the germ theorist. Infection without a soil. How could there be "prenatal infection?" Can a plant grow without a soil? If there be growth there must be soil—ask any biologist. If there be prenatal soil, this is heredity—the condition of growth.

We now give the algebra of the germ theorist. We wish to be strictly fair.

a = Health.
b = The tubercle bacilli.
c = Tuberculosis.

The formula reads as follows:

$$a + b = c.$$

Let us examine. Mr. B., what is your age? Twenty-five. Are you in perfect health? Never better; just took

out a policy for twenty thousand dollars; examined by three physicians and all say first-class risk. Please step this way one moment, Mr. B., I want to examine your sputum. A microscopical examination is made. Tubercle bacilli are found. Mr. B., did you eat butter for breakfast. Yes, sir. Please examine the butter. Tubercle bacilli are found. Mr. B., where have you been this morning? Walking in the open air. Please examine the air. Tubercle bacilli are found. Let us examine the formula:

$$a + b = c.$$

i. e., health + tubercle bacilli = tuberculosis. (Mathematics don't lie.) *This man has got tuberculosis.* Bring in tuberculin and let us make a test. If there be a reaction he has got the disease without doubt. *Tuberculin confirms.*

Ladies and gentlemen of the medical profession, this is medical science as taught to-day. Millions of our fellow-beings are hastening to eternity. Is it not time to call a halt?

Let us proceed. "It is true that either of these forms of transmission of the disease given would be in one sense a hereditary transmission, but it would be transmission of infective material, not of actual disease nor of diathesis. The difference may at first sight appear to be hair-splitting, but, in fact, this difference is of fundamental importance," etc.

The above is rather a singular statement. Please observe—it is hereditary transmission, yet it is not hereditary transmission. It seems like hair-splitting, yet it is of fundamental importance. To the writer it appears like—it either rains or it doesn't rain, for it is very evident if it doesn't rain it must rain.

We now open a field for controversy. "Because there can be no hope of overcoming this dread scourge until the fatalistic idea that it is a constitutional disease can be displaced by a clear conception of its contagious character." The writer thinks that if we wait until "the fatalistic idea that it is a constitutional disease can be displaced" we will

wait *until Mother Earth lays by for repairs and receives a new axle-tree.* In our judgment the constitutional will remain. But we leave this for the future to determine and talk of other things at this time.

If the view herein be clearly understood or correctly interpreted, it is seen an attempt is made to show a law in tuberculosis—an inviolable law; that heredity is a factor aiding this law in an extension of the disease; that all disease of this nature of whatever character is governed by this law.

THE LAW OF SUSPENSION.

The first stage in each case of tuberculosis is one of suspension. This creates a condition of tissue which allows the growth of tubercle bacilli. The tubercle bacilli do not cause the disease, but in many cases render it more fatal—fatal in that they cannot be removed—as a rule, they continue to grow; fatal in that their growth consumes the air which should be taken up by the system; fatal in that their growth renders the lung tissue incapable of perfect aeration, etc.

If in the stage of suspension before a growth takes place or while there is yet a feeble growth, perfect aeration be established or re-established—according to this law—the disease disappears and health is restored. In other words, if a perfect being—meaning by this one free from heredity as a factor—maintain a perfect aeration there can be no tuberculosis. Tuberculosis is, therefore, a disease of ill-ventilation or imperfect aeration. What, then, is the algebraic formula for tuberculosis in the various stages of the disease?

a = Health.
b = Suspension.
c = Heredity.
d = The tubercle bacilli.
e = Tuberculosis.
e' = more fatal.
e'' = most fatal.
a + b = e (formula 1)

i. e., health with suspension added means tuberculosis.

Or transpose b:

$$a = e - b \text{ (formula 2)}$$

i. e., health is suspension taken away from tuberculosis.

$$a + b + c = e' \text{ (formula 3)}$$

i. e., health with suspension and heredity is tuberculosis of a more fatal type.

$$a + b + c + d = e'' \text{ (formula 4)}$$

i. e., health with suspension, heredity and the tubercle bacilli added means tuberculosis of the most fatal character.

This, the writer thinks, is the mathematics of tuberculosis. Other formulas can be given—

$$a + b + c = e' \text{ (formula 3)}$$

Transpose $b + c$.

$a = e' - b - c$, but $a = e - b$ (formula 2)

Things equal to the same thing are equal to each other. Therefore—

$e - b = e' - b - c$ cancelling $e - e' - c$ (formula 5)

i. e., tuberculosis is rendered less fatal by *the removal of heredity.*

THE NECESSITY OF A MORE PERFECT AERATION.

We are told in Genesis the Lord formed man of the dust of the ground, breathed into his nostrils the breath of life and he became a living soul. Whatever the belief as to the genetic account of creation, this much is certain: In the race of life man excels. The swallow of to-day is the swallow of the first century. The lion and tiger eat the same food and procure it in the same way. Not so with man. He alone of all animate creation has shown wisdom and skill in environment.

We rightly feel proud of this, yet there is reason for humility.

To him who reflects and compares man's estate with the domestic mammal, it is evident:

1st. The number of still-born to man is vastly in excess to the mammalia.

2d. The number of deformed or abnormal births to man is vastly in excess to the mammalia.

3d. Of normal births to man, the number who die natural deaths before maturity is vastly in excess to the mammalia.

If, then, the writer observes correctly, man presents the majority of still-born, deformed and of premature deaths. Should the comparison be made with the wild mammal the divergence is more marked.

The conclusion follows: Man with a living soul, or in the exercise of reason, shows physical deterioration.

Per contra, the animal without soul or reason has physically held its own. If true, these statements are worthy our careful consideration. Let us try to consider comprehensively and wisely.

The word childhood is used as the period from conception to maturity. This, as will be seen, is the word in its most comprehensive sense.

At conception the factors that enter the life of the embryo are largely the health and vigor of the parents. The purity of blood, strength of organism, predisposition, etc., all must enter.

During gestation the blood of the mother is the blood of the fetus. The life and health of the fetus is the life and health of the mother. This follows of necessity. From birth to maturity the life and growth of the child is mainly of his own volition, assuming there be proper food and care.

If at conception the blood of one or both parents be impure, if during gestation the blood of the mother be impure, if after birth the environment or food of the child be improper so as to render its blood continuously impure—we have the condition of impure blood from conception to maturity or for the entire period of childhood. Nor is the condition shown an anomalous one among the civilized.

Multitudes of such cases are seen in every generation. Being so common and so easily recognized the only wonder is that its true value is not duly weighed.

For illustration: Should impure food be given the mother during gestation, or to the child during infancy, it is readily seen the health is soon impaired. It is impaired through impure blood. We have spoken of this elsewhere.

But improper food is not the only means of blood impairment. There are many other ways. One of the most prevalent is non-oxygenation. In other words, improper ventilation of the blood as it flows in the life current leads to its impurity. It leads to its impurity in two ways:

1st. The venous blood needs oxygen to change to arterial.

Venous blood must not circulate in the arteries. Venous blood is impure blood and oxygen alone restores its purity.

2d. The chyle poured into the venous current needs oxygen to complete its elaboration or formation into blood.

Chyle must not circulate in the arteries. Chyle is imperfect blood and oxygen alone completes its perfection.

In defective aeration we have these two faults: An arterial blood containing venous blood from the veins and chyle from the lacteals. What is the result? The subject whose life depends on such blood becomes physically weak. The age of the subject makes no difference as to the fact of impurity—only as to power of resistance.

The fetus *in utero,* the infant in arms, the child in the home are all subject to like influence. A fetus *in utero* may absolutely be killed by impurity of the mother's blood. Likewise an infant in arms or a child in the home in so far as they have the same powers of resistance. These facts are worthy of notice and must be taken into account in the consideration of the dread disease tuberculosis of which we speak later on.

We said one who receives such blood becomes physically weak. In what way? He is improperly nourished and a foreign element in his blood must of necessity act as an irritant. Let me illustrate. Suppose a healthy individual eats food that is indigestible and that does not contain a requisite amount of nourishment. He may partake of the food as often as he please but his system constantly grows weaker. Will any one ask how he may become strong? So in imperfect oxygenation. The blood contains an irritant and does not contain a requisite nourishment. The subject constantly grows weaker. He may become strong by a change of aeration. In the adult this change should take place. The adult has reason for a guide. Not so with the child. The fetus *in utero,* the infant in arms has no such monitor. He is subject to the whim or caprice, as it may be, of another. During the infant's minority his life and well-being are but as clay in the hands of a potter—moulded at his will. Should this potter be an ignorant crank the child must everlastingly suffer.

Such is the condition or history of thousands in our land. These waifs who come into existence without thought

or care on the part of the parents become the future men and women to populate and repopulate the country. Is there wonder at degeneration? Could it be otherwise? In this connection the question may be asked, does not nature make an effort to reclaim her own? True, nature makes an effort to secure more oxygen by a hurried respiration in the child, and in a measure and in some instances secures it. Many times it is like the one who tries to gain strength by eating food more often.

If the nourishment be not in the food the rapid eating does no good. So in aeration. Rapidity of breathing only makes the irritant more apparent. It does not increase the amount of nourishment. While this is true in regard to the child, it does not apply to the fetus. The fetus has no respiration of its own. The oxygen of the fetus is from the mother's blood. If the blood of the mother contain but little oxygen, the fetus can secure but little and *vice versa.*

The mother, then, during gestation, has it in her power to give or withhold oxygen. Does she in every case clearly understand this? If so, does she so act?

Thus it is seen that the child or fetus is hedged in, in a peculiar way, in regard to an essential of existence. The mother wrongs her offspring through ignorance. The offspring must suffer the wrong through an inability to rectify. Since civilization began it has been so, and so it must remain until by a clear recognition of facts we change the conditions. Should a child be denied food the public at once cries out. The wrong must be righted. Should an imbecile be born in the home the state provides for its care. Should a child become wayward reformatories are at hand. Should a child be still-born—from want of oxygen—no man in the land has courage to raise his voice. "God moves in a mysterious way, His wonders to perform. He plants His footsteps in the sea and rides upon the storm." Thus the major part of the deaths in childhood are providentially explained. How consoling to the bereaved, "The Lord has given, the Lord has taken away, blessed be the name of the Lord." This, it seems to the writer, is a perversion of

Scripture in the present instance. But there are other perversions.

We stated that during gestation the mother has power to give or withhold oxygen from the fetus. In health this is true. In disease, more particularly of the lungs, this statement should be modified. A woman who has diseased lungs marries. The disease is so extensive it is difficult for her to properly aerate her blood. The field for aeration is so small. She becomes pregnant. A double work must now be done. Not only must she aerate the blood for herself, but also for the fetus. If the field were formerly small, how is it now? Either the mother or the child, or more commonly both, must suffer.

It seems to the writer that one who maintains heredity is not a factor in the transmission of disease, does not clearly understand the situation.

Heredity is a factor not only in the transmission of similarities, but also in disease itself wherever aeration of the blood is concerned. It must be true. So that whatever the view as to the intermarriage of consumptives—weak lungs beget weak lungs and weak lungs beget an infant with imperfect aeration of the blood—the primary step in the advancement of tuberculosis. Without this primary step the disease is unknown.

In corroboration of what has already been stated we herewith present the following typical cases:

Case 1. Mrs. G., æt, about 37—in good health—has had two confinements. On both occasions her children were weak and purple in color on delivery. For several weeks prior to confinement she staid closely in the home and took but little exercise. Her husband is several years her senior and is in poor health. At the third pregnancy, her last, I was notified of the above facts and ordered light exercise during the last weeks and small doses of chlorate of potassium three times a day. Child was more vigorous and less purple.

The ages of the children range about two years apart and the following is the present history twenty years later:

The eldest is delicate, but is able to act as a clerk in a dry goods store. The second died at nine or ten years of age of asthenia. The third is now about twenty—the picture of health—and graduates the coming season.

The writer thinks a supply of oxygen during intra-uterine life has done thus much for him.

Case 2. Mrs. S., æt. about 30, in delicate health and has weak lungs. Has had three confinements. The children's ages range as follows: Between the eldest and second, four years. Between the second and third, two years.

During gestation of second child the mother's health is unusually poor; indigestion, cough and abscess on various parts of the body. At confinement instrumental delivery is used owing to the size of the child—ten and one-half pounds. The father's health is good. Soon after the birth of this child it is observed the breathing is rapid and at times irregular. The child is fretful and nervous and seldom gives the mother a full night's rest. Every tooth a pang, every cold a burden. Treatment is instituted early, but is of little avail. Continued on these lines for upward of two years. Dr. W., Sr., of R ——, one of the best physicians of Northern Ohio, is called in consultation and after a careful examination, said, "It is my firm belief this child cannot be reared."

What is the treatment henceforth? A walk or run around the house once or twice each morning after being dressed. Result: The child begins to improve and continues to do so until he wants to be out of doors the entire time. Fourteen years have elapsed.

What is the present status at nearly sixteen years of age? Last year this boy was captain of a football team that won in nearly every encounter, and this year he throws the sixteen-pound iron ball in a forthcoming athletic contest. Other cases could be given. In the face of these truths, who can deny the value of a more perfect aeration?

Dr. F. N. Otis, in his classical work on "Genito-Urinary Diseases," '83, says in substance as follows: In gonorrhœa, if the perulent discharge come in contact wtih a

healthy mucous membrane it causes the disease. He further adds, this is not true of syphilis. In this disease there must be contact and also an abraded mucous surface. The writer has long held and yet maintains that a healthy or abraded mucous surface and the contact of the living tubercle bacillus does not constitute tuberculosis. There must be something more, viz.: The precedent state. Without this state there can be no transference of the disease or contagion. With this state the disease is readily transferred in the conditions named.

Herein is a radical difference of belief which must be settled before a clear light can be diffused. Let us endeavor to make this still more plain. Dr. Russell says—we quote his writings, for they have been scattered over the land by the Health Boards in various parts of the country—Dr. Russell says: "The tubercle bacillus, not being inherited, but passing into the body from the outside, how does it get there? Under what conditions does it pass from the outside to the inside of the body? Under what conditions does it live and propagate there? It is impossible to demarcate the answers to these questions as clearly as the questions themselves."—(Dr. Jas. B. Russell, B.A., M.D., LL.D, Senior Medical Officer of Health, Glasgow. Republished by permission by the State Board of Health of Massachusetts, 1896.)

The writer answers these questions briefly. The tubercle bacillus gets there by simply growing in a soil prepared. It passes and grows under the conditions of suspension of atmospheric influence. It lives and propagates under the same conditions of suspension. In other words, *if there be imperfect aeration of the blood from any cause and for any length of time, all the conditions named will be found.* On the accuracy of this statement the writer pledges his ideal reputation and challenges controversy. What greater assurance can be asked? We read in current medical literature that of the births of Massachusetts fifty per cent die before they are fifteen years of age. The deaths are largely due to tuberculosis. How sad a commentary on present civiliza-

tion! The burden of rearing children is prior to fifteen. This burden falls largely and heavily on the elder part of every community, the part that practically needs support. Think of it! A child who has grown to near maturity and is educated to a point of self-support is ruthlessly taken away. Can this condition be averted?

After twenty years of close study and accurate research the writer answers this question in the affirmative.

Give us the method at once. By legal restraint in marriage, by careful watching of the mother during gestation, by physical culture in the child, by accurate ventilation in the home and elsewhere, in a word, by a perfect aeration thousands of these youths may be annually rescued to years of usefulness. Is it worth the labor? The writer thinks it is.

In conclusion, with due deference to education, do not tie yourself too closely to the germ theory of tuberculosis, for rest assured in the near future it will be shown that germs have little value.

Tuberculosis is a constitutional disease, induced by imperfect aeration, is based on law and can be controlled.

The mathematics of the situation is as follows: The death-rate from tuberculosis is in direct ratio to abeyance of atmospheric influence.

THEORY OF THE PRODUCTION OF TUBERCULOSIS.

DES DEUTSCHEN VATERLAND.

"Was ist des Deutschen Vaterland?
Ist's Preuszenland? Ist's Schwabenland?
Ist's, wo am Rhein die Rebe glüht?
Ist's, wo am Belt die Möve zieht?
O nein, O nein, O nein!
Sein Vaterland musz gröszer sein!

* * *

"Das ist der Deutschen Vaterland
Wo Eide schwört der Druck der Hand,
Wo Treue hell vom Auge blitzt,
Und Liebe warm im Herzen sitzt.
Das soll es sein,
Das, wackrer Deutscher, soll es sein!

"Das Ganze Deutschland soll es sein,
O Gott von Himmel, sieh darein,
Und gieb uns echten, deutschen Muth,
Dass wir es lieben treu and gut.
Das soll es sein,
Das ganze Deutschland soll es sein!"

We have elsewhere stated, and again affirm, tuberculosis is a constitutional disease dependent largely on the evils of civilization and governed by the following law: The death rate from tuberculosis is in direct ratio to abeyance of atmospheric influence. Suspension of atmospheric influence is, then, the primary cause of tuberculosis, not the germ tubercle bacillus, as commonly believed.

In a former article we attempted to show that deep breathing, in so far as it removes suspension, removes the primary cause in the same ratio, and is thereby curative. We now try to set forth more clearly the true cause or na-

ture of this most serious disease, and in so doing to give as best we may our theory of its production.

In the first place, please bear in mind that tuberculosis is a constitutional disease. Medical writers of this generation are somewhat at variance on this important topic. Some classify the disease as constitutional and then define as local and infectious; this seems contradictory. Others believe it a specific infectious disease, yet fail to state the condition under which the infective germ or cause enters. This essential is omitted—an unwarrantable fault. Still others recognize a condition or state of the system as necessary for its natural transfer; but boldly assert this condition or state cannot be named. The fallacy of this position is shown in "Tubercular Annotations."

Nor is the diversity of belief confined to this alone. It is just as great on the question of heredity in tuberculosis. Ask the eminent German medical scientist of to-day if scrofulosis and tuberculosis be one and the same, and he will answer yes. In the same breath he will affirm heredity is a factor in scrofulosis, but not a factor in tuberculosis. Such teaching is illogical, and, we think, immoral. The eminence of the teacher ofttimes blinds the intellect. Let us endeavor to use logic and truth at the same time. If scrofulosis and tuberculosis be identical they are identical in transmission. The writer claims tuberculosis a constitutional disease—constitutional from the moment of inception; that scrofulosis and tuberculosis are not only alike in nature and manner of inception, but also alike in transmission.

The time has come for medical men to assert with positive earnestness that which they know. The air is full of skepticism and unbelief. The medical world is running wild after the sheerest fads.

Do I speak the exact truth in saying the scientist is largely to blame? It is time, high time, to utter truths and stand by them in argument. What the world wants more than all else is men, high-minded men, who, knowing what is right, dare assert and maintain the same. The medical policy for the last few decades has been one of vacillation

and inaptitude. In no line of work is this more clearly seen than in the management of tuberculosis! The land of science, germs and serums shows its ravages most clearly. When will we control?

These and kindred topics could be presented indefinitely. Why prolong the discussion? It is not that we wish to demolish the structure that has been reared with so much painstaking, but rather to notify the residents of danger. *The foundation is unstable.* The building will ultimately be removed and rebuilt with greater care. At present we are reprehensible if we do not notify.

It was an ancient belief that the life of the animal is in the blood. There is much in this statement to meet acceptance and commendation. As the blood deteriorates the health declines; as the blood flows out the life departs. There is a health standard, so that, as a rule, show the character or composition of the blood and the stamina or vitality of the individual is seen.

Much may be said in extenuation of this belief. Yet on reflection it is seen many things must enter in the composition of the blood; or, perhaps better, many factors are essential in the production or formation of the blood in its perfection. We enumerate some of the more important. As a rule, the richness of the blood depends on the quality of the food. The quantity of food determines more the amount of blood. Yet there are exceptions. A rich food may secure a large blood supply or a plain food a rich supply. There is something strange in this provision of nature. Each animal seems to adapt itself to the food ingested. We see well-nourished people who live on plain food and illy-nourished people who live on rich food. The richness or plainness of the food does not always alone determine the quality of the blood. Other factors enter in its production.

One of these is digestion. It is not alone the quality or amount of food ingested, but the amount digested, that goes to restore an impoverished blood. At all ages a constant waste is going on in the system. In youth there must be also a supply for growth. This waste and supply must be

met. It is met by ingestion and digestion of food. But digested food is not blood. Before it becomes blood it must be taken up and poured into the proper channel, conveyed to the lungs and aerated. It is then blood, and can be used or utilized by the system in its growth or development. This seems very simple, but the latter, or aeration, has apparently been ignored by many of the profession.

To-day there are leading lights in practice who prefer to call in a microscopic germ to account for a faulty aeration. To the writer this seems absolutely silly. Germs do not naturally grow in healthy tissue. Imperfect aeration prepares the soil for the so-called germ of tuberculosis. Change the aeration in this early stage and there is no tuberculosis, or, if you prefer—germ growth. This is certainly worth knowing.

But is not the idea of germ growth recent medical science? Is not the germ theory adopted by all scholars of eminence? Can we set aside so great an array of evidence? What would be the ultimate outcome should we discard the germ theory of tuberculosis? Would we not again go back to our forefathers and start anew? In reply to this we ask, what would the world miss to-day should all knowledge of tubercle bacilli be cast into everlasting disuse? The writer speaks candidly and upon reflection when he asserts the germicidal or serum treatment of tuberculosis is no better than former treatment. If modern treatment is of no avail, why should we cling to it with so death-like a pertinacity? Echo answers, why? It should ever be the aim of the scholar to learn to unlearn what has been learned amiss. We have been learning amiss. Let us correct the error and mend our way.

Two theories, in particular, have been held in the past as explaining the presence of tuberculosis. Let us consider these for a moment:

1. Altered condition of blood originating in a perversion of nutrition, or tubercle, an exudation.

2. Increased cell development and multiplication of the included nuclei, or tubercle, a new growth.

The second or cell growth was held by the world-renowned Virchow, but repeated investigations by careful histologists have failed to find said growth. The supporters of this theory have therefore been few.

The perverted nutrition as found in the first theory is said to be owing to many causes, viz., vitiated air, imperfect assimilation, hereditary taint, etc.

Please notice that vitiated air, imperfect assimilation, hereditary taint, etc., bring in a large field of disease. It seems to the writer that when so many causes are assigned as producing one and the same thing, viz., tuberculosis, we should carefully scrutinize, for such occurrences are rare. It is something as with the vender of medicine who has a remedy for the nomenclature of disease. One is apt to be suspicious of its intrinsic worth.

The writer believes faulty or imperfect aeration produces an altered condition of the blood. It is altered, first, in that the venous blood is not properly changed to arterial; second, in that the chyle is not properly transformed into blood corpuscles. This blood flowing to every part of the system causes or induces the constitutional disease known as tuberculosis. For mark, as already stated, tuberculosis is never a local disease.

(a) Vitiated air may produce this same condition of blood or system.

(b) Heredity may allow this faulty aeration or condition of the blood.

(c) Imperfect assimilation, etc., etc., we think have nothing to do with the condition named.

We also take the liberty at this time to state that whatever destroys or hastily eliminates the red corpuscles remaining in the system hastens the progress of the disease, as child-bearing, excessive venery, etc. The reason is obvious. Perfect blood is being formed slowly. The hasty destruction of red corpuscles from any cause leaves the system in a state of famine, which is slowly overcome. It is in this state the tubercle bacilli naturally enter the system and grow. I ask any fair-minded and candid man, do they cause

the disease? Is not the soil prepared before the vegetation takes root? If so, should we control the soil do we not control the disease? Herein lies the secret of the control of tuberculosis. Herein lies the secret of the ameliorated condition of mankind during the last decade. Our life has afforded a better aeration of the blood. Afford a still better aeration and the disease tuberculosis is more fully controlled. Can we control perfectly? Knowledge in this instance is power. Power gained in an avenue of life means greater insight in future trials. Let us take courage and press steadily on.

The question may be asked, what change takes place in perfect aeration? It is known in the change of venous blood to arterial, the dark red becomes a bright red. Gray, the anatomist, tells us this change is due to the oxygenation of the iron in the blood. Spectrum analysis shows this. In regard to the change that takes place in the chyle in the formation of red corpuscles we have little definite information. It is thought at present the white corpuscles are formed in the lymph ducts or glands, while the red are formed direct from the chyle. Certain it is, chyle is not blood; certain it is the fluid is still chyle when it enters the venous circulation. Passing directly to the lungs, it leaves them as blood. The change or conformation takes place during aeration. In the absence of further light we assume aeration changes chyle to blood. It is when an imperfect blood is formed, or, in other words, it is when there is an imperfect aeration, that the bacilli take root and grow. The imperfect aeration in every instance precedes the vegetable growth, or the soil precedes the growing plant. The vegetable growth, then, may modify the disease, but *is not the cause of it.*

The construction of the thoracic duct in being single, while many organs are placed in pairs; the plan of discharge, in that it commonly empties its contents into the left vein and not into the right, or both, are among the anatomical peculiarities of this alone. The commingling of the chyle with blood already devitalized and with the bulk of

the body's lymph; the passing of the united stream to the lungs to combine with the oxygen of the air, shows a wisdom of construction seldom seen. The exact change that takes place is not known, but the combined stream continually flowing gives life and vitality to the whole organism. We feel assured that when any change occurs in this current either by man's device or folly, the entire system must suffer. *It is no local disease.* In point of fact, this is what is seen in surgery. Remove a tuberculous mass from any part of the body—does the wound heal readily? Is the disability removed entire? *In no case is this true*—plain evidence to the writer that tuberculosis is not a local disease. Treat the subject constitutionally; give him, in so far as possible, a perfect aeration of the blood, and I pledge you the patient in every case will receive a benefit.

It is these little things which tell us plainly the law of tuberculosis must be true.

INTROSPECTION.

By introspection or the introspective method is meant the studying of mental phenomena by means of one's own consciousness. Everything about us or within is a subject of consciousness. We are conscious of one's presence or absence, of an opinion or belief, etc. We study or grasp in its entirety as we lay hold of the mental phenomena connected therewith. So that the introspective method presupposes a rational being in its exercise. *Mind is necessary to reason.*

The introspective method is used at this time not so much to look into or examine the individual as to search out or investigate theory. Medicine is full of theory—theory as to cause, prevention and cure of disease. Some are true, many are false. The wise physician discriminates. He distinguishes the true from the false. How better to do this than by the exercise of reason in the introspective method?

To-day we have a theory of the disease tuberculosis. On what is it based? Evidently, not on reason or analogy. It is based exclusively on microscopical examination. Certain microscopic organisms are found in certain locations at certain stages of the disease tuberculosis. These are *assumed* to be the direct cause. The writer thinks this wrong. He has his reasons for so believing. Microscopic organisms do not naturally grow in health or induce disease.

(a) Microscopic organisms, like all plant life, grow where the soil is properly prepared.

(b) The preparation of the soil, in every case, precedes the growing plant.

(c) The soil is, then, the first stage or cause of tuberculosis.

How is soil prepared? By suspension of atmospheric

influence. What does suspension of atmospheric influence induce? A faulty aeration or impure blood. What are common methods of suspension?

(a) Heredity, in that an imperfect lung tissue aerates the blood in an imperfect manner.

(b) Ill ventilation, in that an impure or impoverished atmosphere fails to furnish the requisite amount of oxygen.

(c) Occupation, in that there is a mechanical obstruction to aeration.

In these and other ways a soil is prepared in the individual which allows the entrance of the growing bacillus, or so-called cause of tuberculosis. This growth, if cause at all, as already shown, must be a secondary one.

Based on the same assumption is a theory of the prevention of tuberculosis. If the tubercle bacillus be the primary cause of tuberculosis, and all germ theorists believe this, the prevention of the disease in *theory* is very simple. It is simply to prevent the entrance of the growing germ.

In *practice* prevention is found a very different matter. In truth, the germ naturally enters the system and grows without the rational aid of man. To prevent its entrance and growth, or in other words, to prevent tuberculosis where there is a favorable soil, according to present notions, is not in the power of man. *Prevention of tuberculosis is, then, practically a dead letter.*

Look around you and see if this be not true. The eyes of the profession are slowly opening. Give us more light!

Based on this assumption, that tuberculosis is a specific infectious disease is a theory of treatment. In the writer's judgment, in no phase of medical literature is common sense and intellect more perfectly held in abeyance.

(a) Tuberculosis is caused by the tubercle bacillus.

(b) The bacillus, in growing in the healthy system, gives out or throws off ptomaines, leucomaines, etc., which poison and ultimately destroy.

(c) The extract of these same bacilli, grown under other circumstances, injected into the diseased system prevents their normal action or is curative. Wondrous thought!

Suppose you give a healthy man an ordinary dose of strychnine. Suppose your neighbor practitioner injects another ordinary dose. Is there a sane man in the universe who will argue that one dose counteracts the other? *The germ theorist has been teaching this the last two decades.* Ladies and gentlemen of the medical profession, are we professional thinkers or are we incorrigible asses?

On the same line of assumption is the theory of immunity. To claim in one breath that a plant growth throws out a poison which causes a disease and in the next to claim the same poison injected secures an immunity! Rationally considered, how could one and the same poison both cause and prevent a disease? What shameless folly! But, in this case, we leave out reason entirely, and ask: *Does it do it?*

We stated suspension of atmospheric influence causes an imperfect aeration or impure blood. That this condition is found in all cases of tuberculosis we candidly affirm. That others now recognize this truth is plainly shown. Prof. Osler says: "The arrest or cure of tuberculosis is a question of nutrition entirely, and that the essential factor is to improve the resisting forces of the body so that the disease cannot make further progress or is eradicated. *Fresh air and good food are the most important means by which the nutrition may be increased.*" (Maryland Medical Journal.) Please remember these are the words of a renowned germ theorist. Please note Prof. Osler claims tuberculosis a specific infectious disease, yet treats it as a constitutional one. The writer claims tuberculosis a constitutional disease, based on law, and treats it as such. Which is the more consistent? We leave this to others.

But mark, there is something of more practical worth to the living than the treatment of tuberculosis. Need I say prevention? So soon as we clearly understand the cause of disease, so soon are we able to see clearly a method to prevent the same disease. So long as we teach one thing and practice another, so long the great mass of the world's people will remain in blissful ignorance.

By a proper use of the introspective method we may not only examine our own theories, but those of others, and the world is thereby made wiser.

INCIPIENT TUBERCULOSIS.

"The forces of the universe are in league against a lie." —Emerson.

Definition: A constitutional disease dependent largely on the evils of civilization, and governed by the following law: The death rate from tuberculosis is in direct ratio to suspension of atmospheric influence.

Speculation has been rife whether tuberculosis is transmitted. Some have said yes, others no, and a vast host of the profession are as yet undecided.

That the author's statement appear not biased, contemporaneous writers are quoted:

"Consumption is caused by a germ known as the tubercle bacillus, etc. This germ is not inherited, but is always contracted from some other case," etc. (State Board of Health of New Hampshire.)

This statement, coming from so high a source, has the merit of being definite. There is only one fault we at present observe, viz., the forces of the universe are in league against it.

"It is an admitted fact that no child is born with tuberculosis, yet they do inherit that peculiar, lymphatic, anæmic, poorly-nourished constitution which gives them but little or no resistance when exposed," etc. (Jas. A. Burroughs, M.D.)

"In 1861 I attended a phthisical woman in her first confinement. She belonged to a consumptive family, had suffered herself before she got married, and died in the third week after confinement. The fetus was born at the end of the seventh month of utero-gestation, and lived a few minutes only. There were numerous gray military tubercles in the tissue of the liver near the surface, a few in its peritoneal covering and the spleen, and on the pulmonary pleura." (A. Jacobi.)

Please observe, the one says, "No child is born with tuberculosis"; the other says "I have seen tuberculosis in a seven-months' fetus." Does the fetus invariably die before viability? If not, of what value is the "admitted fact?"

The truth is, many children are born "with that peculiar, lymphatic, anæmic, poorly-nourished constitution," but only a portion of them have tuberculosis. Why not all? To the writer the reason seems plain. The proportion who take the disease, in some way, have suspension of atmospheric influence; the others do not have said suspension.

"The prevention of tuberculosis by prohibition of marriage of consumptives will remain an Utopia until human nature changes and the reason exerts a greater influence in such matters than the emotions." (St. Louis Medical Review.)

If we clearly apprehend, there is a brighter future for humanity when reason has full sway. In other words, marriage can be regulated to diminish tuberculosis. This, if true, should be clearly understood by all. The minister, justice and judge alike need enlightenment.

"Tuberculosis unquestionably may be inherited, but in what way and how often are unsettled problems." (Osler's Practice.)

The writer, in his weak way, attempts to render matters more clear and simple. In order to do so the germ theorist is taken on his own ground. It is said tuberculosis is due to a germ, or rather tuberculosis is germ growth in the system. The writer thinks differently. He believes tuberculosis is an induced state or condition under control, and germ growth simply secondary. His reasons for so believing are as follows: No plant life can take root and grow without a suitable soil. The tubercle bacillis is plant life. Therefore the tubercle bacillus, in growing, has a suitable soil. If found growing in one's system a suitable soil is found in said system; otherwise it does not grow. No growing tubercle bacilli are found in a healthy organism.

It is seen *the soil must precede the plant growth.* To this rule or law there is no exception. Herein lies the fal-

lacy of the germ theorist: He assumes the plant tubercle bacillus causes the disease tuberculosis because it is usually found in every typical case.

As in creation primeval the sun came into existence before vegetation, so in tuberculosis suspension of atmospheric influence ever precedes the advent of the germ. Flood the earth with sunlight and vegetation at once starts. Suspend atmospheric influence in the individual and the same condition prevails—the germ grows. Withdraw all sunlight and vegetation ceases to exist. Sunlight to the earth's vegetation is as pure atmosphere to earth's people. *Perfect ventilation means freedom from tuberculosis.* The knowledge and application of this simple truth will rid us of the most deadly disease known to the human race. Is not such knowledge worthy attention? The writer so considers it. Let us proceed.

Much time and labor have been spent in determining how the tubercle bacillus enters the circulation and grows in various parts of the body; how the germ enters the mother's blood-current and by means of the fetal circulation is conveyed to the fetus. By some this is thought to be truly marvelous. When the view entertained by the writer is closely examined he thinks the inexplicable is rendered more plain. The condition precedes the growth in every instance. It has been shown this must invariably be the case. A child or person has the condition or precedent state. It matters not for illustration how obtained—by heredity or suspension in the individual. He has the condition or soil. All that is requisite is the presence of the germ. These so-called germs are everywhere present. Is there anything mysterious in their growth? Yes, but the mystery is as the growth of a blade of grass or kernel of wheat. "Simply this and nothing more."

At times much ado is made because certain meats contain tubercle bacilli. Has it ever entered the mind of the scientist that meats may be tuberculous in the absence of tubercle bacilli? The writer has the temerity to assert that

sometimes, though infrequent, this may be the case. Suppose these germs are thus found in said meat? Is there any general outcry when these same germs are found in the food we eat and the water we drink? If not, why not? Is not the major portion of our food and drink taken cold—or not sterilized—before eating? Are not our meats sterilized in the cooking? "Consistency, thou art a jewel."

Again, we are told so much about a "former case," as if no case of tuberculosis occurred unless there be a preceding case in the same house or neighborhood. This seems absolutely silly. If tubercle bacilli cause the disease tuberculosis; if tubercle bacilli be everywhere present, what is the use to everlastingly harp on the "former case?"

If the germ truly causes the disease, and germs continually float in the atmosphere, rationally considered one germ would cause the disease the same as the germs in a "former case." Hence, we have illustrated cases like the following:

Mrs. K. is sixty years of age and has an infant grandson living at her house. Mrs. K. has had a chronic cough for years. The grandson is losing flesh and having night sweats. He at times has a slight cough. After several weeks he dies. No autopsy. Physicians assert this little fellow had tuberculosis, and that he caught the disease from his grandmother. Are you satisfied with the inception of the disease? The writer claims a soil is first prepared. When prepared, the tubercle bacilli, from whatever source, readily grow.

For a writer to assert that every extension of the disease is due to a "former case" would be to assert that germs must be fresh in order to infect new victims, *i. e.*, the infectious material is carried with the fresh germ, or, in other words, *is external to itself*. No true germ theorist could accept this. We are therefore led to believe it is the germ alone that grows, but it grows in a *soil already prepared*. The germ does not prepare the soil.

The fundamental principle involved is not how recent the germ, not from whence derived, but how is the soil prepared in which the germ thrives. Do we hold in our hands

the preparation of the soil? Can we prevent its formation? If answered in the affirmative, we can control tuberculosis.

Take, for instance, the case presented by Dr. Jacobi. The mother is tuberculous, *i. e.*, has suspension of atmospheric influence. The soil is prepared and tubercle bacilli are growing in her system. Like produces like. The fetus *in utero* has the soil of the mother. If bacilli grow in the mother they likewise grow in the child. They are thus growing when observed by Dr. Jacobi.

Another mother is healthy. The fetus *in utero* is also healthy. While tubercle bacilli may be found in the tissue or blood of both mother and fetus, they are not found growing in said systems. Why not? There is no soil, no suspension of atmospheric influence. Hence, freedom from tuberculosis.

Another case presents. The father is in the last stage of tuberculosis—so feeble he is unable to walk but a few steps. His wife is in fairly good health and becomes pregnant at this time. A miscarriage shows tubercular development in said fetus. How explained? It will at once be admitted this is an unusual method of transmission. Tuberculosis usually descends from parent to child through the mother. Not always so. The father may also transmit the disease. All conditions must be favorable for this consummation. What are the conditions? The germ theorist exclaims it is readily explained: "The seed of disease is in the semen of the father." The writer asks: "My dear sir, or madam, how can a seed grow without a soil?" True, the tubercle bacillus may be in the semen. It may also be in the blood of the mother or fetus.

Why does the so-called germ grow in the fetus? Let us attempt an answer. The mother, apparently, is in good health. She takes little or no exercise. What of this? Her very inactivity causes suspension of atmospheric influence in herself and fetus, and allows the tubercle bacilli to grow. Hence, growth and consequent miscarriage. The same condition prevails if suspension occur in any other way.

This, we think, a correct interpretation of facts.

After twenty-five years of active practice the writer recalls abortion and miscarriage enough times to recognize the certainty of heredity in tuberculosis. Knowing this, he thinks he has a clear idea of the inception of the disease.

AS OTHERS SEE US.

"O wad some power the giftie gie us
To see oursels as others see us!
It wad frae monie a blunder free us
And foolish notion."—BURNS.

COLORADO SPRINGS, COL., August 27, 1898.

DR. H. H. SPIERS, Ravenna, O.

DEAR DOCTOR—Allow me to congratulate you on your article in the Medical Record, "The Control of Tuberculosis." I was much interested in the article and am in strong sympathy with you on many points mentioned in it.

I cannot, however, entirely agree with you as to the fact that if a person is kept clean, takes daily exercise, inhales pure air, that such a person cannot develop tuberculosis if heredity is thrown out, as I have seen cases that fulfilled all these requirements to a most perfect degree and yet did develop tuberculosis, possibly through milk as a child, the germ lying dormant for years.

I send you a reprint of some of my work.

Yours truly,
C. F. GARDNER.

The above is one of many letters in our possession. It is difficult for us to answer or take note of all.

In the first place, we ask no one to entirely agree with us. In truth, we do not expect this. The fact that one differs in some minor point is *prima facie* evidence he has ideas of his own. When one accepts ideas, style, language, etc., of another, and swallows it, however crude, it is marked evidence that person lacks individuality. We try to be broad ourselves and allow the same latitude to others. At the same time a law must not be set aside to attend minor details. The law should have precedence.

We fear our able contemporary does not clearly comprehend the nature of tuberculosis. We are led to believe this from the "reprint of work" sent us. The author seems to be grappling with the germ theory of this disease. Leave the germ theory alone. Set it aside for the present and

carefully examine the law of tuberculosis. What is tuberculosis? A constitutional disease dependent largely on the evils of civilization, and governed by the following law: The death rate from tuberculosis is in direct ratio to suspension of atmospheric influence.

Two things are noticeable: (a) Tuberculosis is a constitutional disease; (b) tuberculosis is governed by law.

In each of our articles we have endeavored to make these facts clear. The one quoted in the Medical Record is, we think, no exception.

So that if our friend, Dr. Gardner, fails to take in these truths he fails to properly appreciate our effort, though he congratulate. For this we feel sorry.

The error of Dr. Gardner is not uncommon. This mistake is seen on every hand.

Why are we so dull of apprehension? This is certainly un-American. Americans have perceptives and use them. Why so dull in this? Two reasons can be readily assigned: (1) Education; (2) authority.

In one sense it is true; we believe what we are taught to believe. Europeans have saddled upon us a germ theory of tuberculosis. This theory is taught in the schools. We are educated in this belief. Germs there must be, for we can see them. Seeing is believing. Cause the disease they must, for they are found with the ailment. No further question need be asked. If one ask why these germs are found in certain conditions he is regarded a heretic. If one suggests there may be the condition in the absence of germs he is regarded as a lunatic. If one speak of the condition prior to the entrance of growing germs he is asked if he studied bacteriology in Heidelberg. Bacteriology and high-power microscopes are at a premium. Reason and common sense are excluded.

Does the writer express a truth? If so, is not this judgment manifestly unfair? Education—school learning—is one thing, and education—progression—another. The one is memorizing dry statistics; the other the use of the intellect in the higher sense. Which shall it be?

Again, there is reverence of authority. A young freshman, on being asked what he thought of the professors in the school he was attending, replied: "They are foine men, but they have no hids." Now herein is a fault with many authorities: They have no "hids." A professor in medicine who sits down and deliberately compiles statistics week after week, then quotes them in his lectures as law and the gospel has no "hid." He may be pre-eminent in science; he is only eminent in common sense.

Can we improvise "hids" for them so situated? This is a question not only for the near future, but for all time.

We travel in ruts. If one step from the beaten track he is regarded a heretic or lunatic. Yet mark, it is these side-steps that make progress in science, literature and the arts.

To return: "If a person is kept clean, takes daily exercise, inhales pure air, that such a person cannot develop tuberculosis if heredity is thrown out." If heredity be thrown out we take it for granted the subject is perfectly healthy so far as tuberculosis is concerned. The sentence then reads: If a healthy person be kept clean, takes daily exercise and breathes pure air he cannot develop tuberculosis.

Keep clearly before you the proposition. What is it to develop tuberculosis? "Answer ye who will." Tuberculosis has been defined a constitutional disease, etc. If one develop tuberculosis he must develop or acquire a constitutional disease. How does one develop or acquire a constitutional disease? This one disease, tuberculosis, is developed or acquired in one way—only one—suspension of atmospheric influence. If there be no suspension of atmospheric influence there can be no tuberculosis. If the healthy person be kept clean, takes daily exercise, etc., there is no suspension. Therefore there can be no tuberculosis in his case.

"But," says Dr. G., "I have seen cases that fulfilled all these requirements to a most perfect degree and yet did develop tuberculosis," etc. The writer asks, "How can

these things be?" Various explanations may be given. The one most probable is that Dr. G. is mistaken in his cases.

In this connection perhaps another conversation will be allowed. Some time ago, on meeting my friend, Dr. X. C. Scott, of Cleveland, O., he congratulated me on a paper read at a certain society. His language was somewhat as follows: "Doctor, it is seldom I listen to papers outside my specialty, but yours was an exception—one of the best I ever heard. But, by the way, your theory of suspension don't work. Why, this very summer I traveled all through Mexico, and I saw many cases of tuberculosis. The climate is warm, the people live in the open air, and if you are right there ought not to be any disease of this kind. You are evidently mistaken." He continued: "Oh, by the way, doctor, do you know of a peculiar custom of sleeping in Mexico? *They always wrap their head and face in a blanket.*"

Is it clear why there is tuberculosis in Mexico?

Suppose some one should tell you that Dr. Gordon, of Mexico, committed suicide by drowning. How can it be possible? There is but little water in Mexico. How much water does it take to drown when one is so disposed? So suspension of atmospheric influence may be produced by *simply covering the mouth during sleep.*

It requires but little suspension to produce a diseased constitution. A diseased constitution so caused allows the tubercle bacilli to enter and grow—so-called tuberculosis.

With due credit to Dr. Gardner for his honesty, wisdom and acuteness of perception, is it not probable he is mistaken? Have any of these patients—referred to as healthy—had stenosis of the air passages? If so, suspension of atmospheric influence. Have they had measles or pertussis? If so, was recovery perfect? If not, suspension of atmospheric influence. Did any of these healthy patients ever work at an unhealthy vocation, as stone-cutting, etc.? If so, suspension of atmospheric influence. Did any of these parties, at any time, have a history of slow recovery

from typhoid fever, with lung symptoms? If so, suspension of atmospheric influence. Tuberculosis frequently follows after the lapse of years.

One other question: Who in any land can say in any case that heredity is excluded? Heredity, like the sun's influence, is felt in every land where a race exists. Let no one assert the contrary—*I know this is true.* Hereditary influence no man can measure. When one asserts heredity is left out he only approximately determines this truth—nothing more. Dear doctor, the writer feels assured you are mistaken.

We close with an extract from a letter referring to State regulation of marriage.

FALL RIVER, MASS., August 24, 1898.

H. H. SPIERS, M.D., Ravenna, O.

MY DEAR DOCTOR—I have just read your article in the Medical Record of August 20th, and wish to thank you for it. As to the question of State regulation of marriage I think you might have gone a step further than you did. The bill introduced into the Ohio Legislature was certainly a step in the right direction, and, as you say, in the years to come some measure of similar character will be enacted for the protection of the body politic.

I am at present at work along the same lines and may have something to send you one of these days. State regulation of marriage is as important and as much a function of the State as regulations covering vaccination, contagious diseases, boards of health and the like.

Very truly yours,

GEO. L. RICHARDS.

THE SOIL.

For many years, a few medical writers had observed the value of open-air treatment in tuberculosis.

Notably, Austin Flint, Sr., mentions this in his "Practice of Medicine," 1873, in speaking of the early settlement of Illinois. Others could be referred to, but it is not the object of the writer to enter into historical research at this time. Suffice it to say, no writer—English or German—so far as known, ever laid down a law indicating a line of treatment for tuberculosis. The writer claims priority in this.

True, Koch discovered the tubercle bacillus, and claimed it the cause of the disease. That Koch is a microscopist, none will gainsay. That he lacks in practical application is shown in his vaunted tuberculin.

But it is evident to every one that no plant organism creates its own soil. The soil and organism are two separate entities. The organism cannot exist without the soil, and must of necessity be secondary. To say a vegetable organism creates that in which it grows, is contrary to reason and common sense. *The bacillus per se is as inert as the clods of the valley.* In truth all authors now recognize a soil. In what this soil consists no one has definitely stated.

The law of tuberculosis plainly indicates the character of the soil, and how formed. With this truth before us the treatment of the disease is rendered more clear and simple. The law is as follows: The death rate from tuberculosis is in direct ratio to suspension of atmospheric influence, *i. e.*, if the suspension be great, the death rate is great, and *vice versa*. Now as to treament, if there be an entity creating the soil, remove the entity and the formation of soil ceases. If the soil allow the entrance or growth of the tubercle bacillus, when the soil is removed the bacillus disappears. This has been the teaching of the writer for

many years. Bacteriology may dispute this ground. It is its province to do so. But nothing is made by the germ theorist in claiming that which he cannot maintain.

Bacteriology, like all kindred studies, must rest on merit or worth alone. No other basis will be accepted. It remains for the thinking man to put at its par or face value all these things. They are worth just the worth that can be shown of them; no more nor less. Examine and pass on them for yourself. This is the province of every physician. The writer well knows in making these statements he is at variance with certain medical men. The truth will ultimately prevail. One with truth is a majority; majorities we seek. To the writer it is sometimes puzzling, and at other times amusing to hear remarks on soil. Speak to the average physician of soil in tuberculosis, and you will hear remarks like these: "There is nothing new in this," "Tell us something new," "All doctors speak of soil," "We are taught of soil in the schools."

Doctor, please tell us in what the soil consists?

"The soil is a dyscrasia," "A depression of system," "A lowered vitality," "A malnutrition," "Anything that lowers the vital powers," etc.

Let us see if these definitions be accurate. Do any one of these answers tell us plainly in what the soil consists? Does dyscrasia, lowered vitality, depression of system, malnutrition, etc., make it plain in what a soil for tuberculosis is, or is not? We think not.

Hundreds of people have dyscrasia, lowered vitality, depression, malnutrition, etc., who have not tuberculosis. If the soil consists in these, *why do they not always have the disease?* But they do not. Seldom do they. Can you bleed one into tuberculosis? This is depression. Can you starve one into tuberculosis? This is lowered vitality. Do dyspeptics always have tuberculosis? Here is malnutrition. Will loss of sleep cause tuberculosis? In this the vital powers are lowered.

It is seen that soil consists in more than these, or perhaps better, these do not cover the ground of soil in tuber-

culosis. The disease does not invariably follow these conditions. In truth the disease seldom follows these conditions. There must be something else. What is this something else?

The law plainly indicates: Suspension of atmospheric influence. How do you know this to be true? "The proof of a pudding is in the eating." *Because suspension of atmospheric influence is always the first stage of the disease tuberculosis and then the bacillus enters secondary.* The suspension creates the soil. But why not say suspension of oxygen influence? The oxygen is the principal element of the atmosphere left out, is it not? True, it is an element left out, but not the only element.

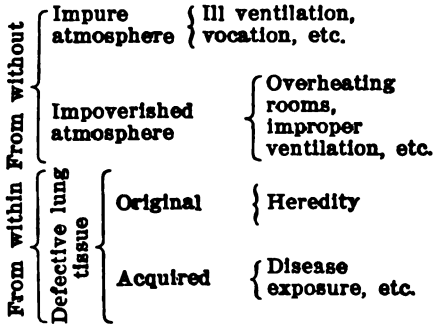
Inhalation of oxygen does not restore the patient to health, whereas the atmosphere does, *i. e.,* in curable cases of the disease. This is shown in practical experience with tuberculosis, as many can testify. What the atmosphere contains of a vitalizing nature, aside from the oxygen, the physiologist has left unanswered, but that it contains more than this, the writer is ready to affirm. Hence in his law he uses suspension of atmospheric influence. The writer said he had been amused in the loose way in which soil is used.

A short time ago a physician stated in substance, as follows: "I was offered a position as manager in a sanitarium, but refused. Was afraid that in *some way* I would get the *soil,* and then you know there is no hope." Soil to-day has a scriptural garb, and tubercle bacilli are spoken of as seed. "Some fell by the wayside, some in stony ground, and some took root, etc." There is this difference: Our Savior told in what the soil consists; not so the bacteriologist. Medical teaching at present is somewhat as follows: An agent in mid-air—with ship gently sailing—is scattering bacilli right and left, and loudly calling, "Beware, beware, beware of *getting the soil!*" What soil? Should Uncle Sam place at each cross-road in his vast domain, some startling announcement like this: *"Beware of the guyascutas!* It is found in every town and hamlet. *Its*

bite is certain death!" he would be the recipient of a ton of letters in a few hours, asking a description of the animal. Such information would have to be coming forthwith. Not so in medicine. One can lecture for years on soil in tuberculosis, and not be asked to clearly define the term. Only a short time ago we were told an abraded mucous, or cutaneous surface, let in the dread tubercle bacillus, and tuberculosis followed. Later, of a constant conflict at the portals of entrance—sometimes lasting for years—the patient meantime dying of another disease. To-day it is judicious care, not to secure a hypothetical soil. In other words, *be afraid of an undefined entity.* To-morrow perhaps it will be something else.

Now what the author wants, is a little more clearness in apprehension, or perhaps, definition. Suspension of atmospheric influence is induced in what way? The following was published many years ago, and explains clearly the views of the writer. Of course nothing of this kind can be fully satisfactory:

Suspension of atmospheric influence.



We said "the proof of a pudding is in the eating." Test any of the above conditions, and see if the writer be not correct in his ideas of soil in tuberculosis. Go through the prisons, convents, workshops, etc., or examine the records of the same, as to sickness and death rate from tuberculosis, and secure results. Place animals under like conditions, and see if like results be not obtained. This certainly ought

to satisfy as to suspension from without, in causing or creating a soil. If there be these conditions in the home or shop, remove them and the soil disappears. This is the true secret in the prevention and treatment of tuberculosis. When suspension takes place from within, it is seen there is a different condition creating the soil. A different method must be taken to remove the same.

What does one inherit in tuberculosis? A lung tissue that does not allow a perfect aeration of the blood. He inherits a thickened and inelastic lung tissue, a lung tissue that requires greater effort on the part of the subject to secure aeration, or to remove suspension when present. Hence he is more subject to tuberculosis, and less likely to have it removed.

Here is a physical infirmity that can be changed only through the generations by proper selection in marriage. Should the tuberculous marry is a subject for legislation. When there is an acquired or thickened lung tissue, as after measles or pertussis, there is great danger from suspension or the creation of soil. Records show a greater death rate from tuberculosis after these diseases than from others. The reason is obvious. The thickened lung tissue leads to the creation of soil. The soil, then, in whatever way created, is one and the same. The method of removal must be in accordance to the way created. It is also seen, the tubercle bacillus is secondary as a factor in the creation of the disease. This is certainly worth knowing, for in the prevention or cure of tuberculosis it may be so regarded.

A celebrated writer said, "Care for the minutes, and the hours will care for themselves." The present writer says, "Care for the soil, and the bacilli will need no care."

TRUTHS CALMLY CONSIDERED.

A report or synopsis of the transactions of the British Congress on Tuberculosis is before us, and we notice: "The factors of treatment other than diet receive little more than mere mention in the proceedings." Why the omission?

That drugs have value in the treatment of tuberculosis is known to every observing physician. That drug treatment *per se* is of *little* value is also clearly recognized. When to use drugs, the kind and dosage, must ever be left to the discriminating practitioner. No one can lay down fixed and infallible rules for guidance in the many phases of tuberculosis. That there are occasions when they should be used none can deny.

One patient desires relief from the persistent hacking cough, another from the exhausting night-sweats, still another from a prostrating diarrhea or hemorrhage. Relief is asked and must be given. These and kindred conditions are met by appropriate treatment.

But the wise practitioner does not confine himself to drugs alone. All accessories are used in treatment. One of these is diet or forced feeding. While duly considering the value of diet in tuberculosis, the wise physician will recognize it is not all in all. It is only an accessory.

The life and well-being of the tuberculous does not depend on food alone. There are other factors worthy of consideration in this connection. We mention some of them.

Two things are clearly recognized: (a) Tuberculosis is a disease of civilization; (b) the civilized are the best fed.

Speaking, then, *in toto*, good feeding may be a *cause* of tuberculosis, but it is manifestly neither a preventive nor cure, else the civilized world would be free from the disease. There is no other alternative. In the treatment of

tuberculosis something more than diet or forced feeding is required.

The British Congress has a high object in thus coming together—*the stamping out of tuberculosis.* The writer does not question the motive in the least. It is *the method pursued.* Let us illustrate.

Should a society of ax-grinders meet to discuss the wage problem and then spend their time in talking of the weather, one could see the irrelevancy of the proceeding —perhaps not so clear when applied to the British Congress. But if the best-fed nations or bodies of people on the earth are most afflicted with the fatal disease tuberculosis, and this fact be accepted as patent to all, is it not irrelevant for any body of scientific medical men to publicly announce "diet" as the *sine qua non?* Of the two bodies, would not the ax-grinder use his time to the wiser purpose? We leave this to others more competent.

What is tuberculosis? A constitutional disease dependent largely on the evils of civilization, and governed by the following law: The death-rate from tuberculosis is in direct ratio to suspension of atmospheric influence.

Thousands are working in a dust-laden atmosphere—suspension. Thousands are living in ill-ventilated apartments—suspension. Thousands are suffering from the factor of heredity in tuberculosis. Take it as you please, the writer claims one inherits a lung tissue that does not allow a perfect aeration of the blood—suspension. Thousands are suffering from thickened lung tissue, catarrhal conditions, etc.—suspension.

Thousands are suffering from all these combined: Working in a dust-laden atmosphere by day, sleeping in an ill-ventilated apartment by night, the subject of heredity in that father or mother died while young of tuberculosis, also the subject of chronic cough.

Suspension is the cause of tuberculosis in that it creates a soil for the natural entrance and growth of tubercle bacilli. Are bacilli of tuberculosis factors in the disease? Yes, in that they hasten disorganization of tissue or death of

the patient; not primary factors in that they do not create the soil. The soil is induced by suspension, and the bacilli are then given a natural entrance and growth.

The writer asks one plain question—only one: Will "diet" prevent suspension? If so, it is a means to cure in tuberculosis. But *it is not the only means*—only one of many. What other means have we at hand?

Recognizing the soil as the primary factor, and the law regulating its induction, we have a means at hand at once potent and conclusive. What are these means? Efforts made in every direction to remove suspension. If dust, ill-ventilation, heredity, catarrhal conditions, etc., remove the conditions, etc., by education and legal enactment.

"But," says the germ theorist, "how about the bacillus? What are we to do with the bacillus?"

Leave the bacillus alone; he needs no care. Care for the conditions which prepare the soil, and the writer pledges his ideal reputation the bacillus will cause no trouble. *It is perfectly harmless.*

To him, who, by a broad experience, comprehensive grasp and clear vision of natural relations, it is seen that present conditions do not meet requirements. Diet, care of the bacillus, tuberculin, etc., do not prevent tuberculosis; neither do they cure.

Mankind are looking for cure and prevention of the disease. In this search please remember the old adage, "An ounce of prevention is worth a pound of cure." Prevention must always hold the greater field, the surer place. *A perfect cure will never be found except in prevention.* This truth ever bear in mind.

But in the present state of our science what factors are most conducive to cure in tuberculosis? We answer boldly, without fear of controversy, the open-air treatment of the disease.

Another question: Why does the open-air treatment of tuberculosis take precedence to all other methods? In that it fulfills all indications most fully.

What are the indications? The one great indication is *the removal of soil* or that which leads to it—*suspension.*

What is the rationale of this procedure? It is simply this: The law of tuberculosis says the death-rate is in direct ratio to suspension.

If true, should we by any method lessen the suspension we lessen the death-rate in the same ratio. *Is this clear?* If so, is it of value? The writer thinks it is.

If dust, ill-ventilation, heredity, catarrhal conditions, etc., are a means of suspension; if we lessen these, we lessen the death-rate or *increase the proportion of cures.*

Does observation and clear examination of facts justify one in making these statements? The writer believes it does.

In 1893 the law of tuberculosis was presented to the Ohio State Medical Society at Put-in Bay. It is published in the Transactions of the same year. Two years before this date the law was read before the Portage County Medical Society.

When we consider the little open-air treatment in vogue prior to the above dates; when we consider the extent to which it is being used at present and the relative great proportion of cures, one can but fairly estimate its beneficial results and assured continuance. The writer feels proud in commending this treatment to the profession at large.

Some may ask, while it is plainly seen the open-air treatment leads to a more perfect aeration of the blood or removal of suspension, can it be shown that the growth of bacilli is affected thereby? The writer thinks it can. Suspension leads to the creation of a soil. The tubercle bacilli then enter and grow. A perfect aeration removes the soil and the tubercle bacilli are compelled to leave.

In other words, the writer divides tuberculosis into three stages, simply for convenience:

First stage—Creation of soil.

Second stage—Natural entrance and growth of the so-called germ, tubercle bacillus.

Third stage—Disorganization of tissue, or death of patient.

It is seen the bacillus is not a factor in the first stage of the disease. It is a factor in the second stage. What does it accomplish? Hastens the third stage—disorganization of tissue or death of patient.

Now no one could claim it would be wise to inject a faulty tuberculin in the first stage of tuberculosis. Why? It would hasten the very disease he wishes to prevent.

No one could claim tuberculin a diagnostic in the first stage of the disease. Why? No bacilli are growing.

No one could claim that any alkaloid of tubercle bacilli could create, prevent or remove the first stage of tuberculosis according to the writer's classification.

It is thus shown tubercle bacilli have no causative relation or association with the first stage of tuberculosis. It is purely a case of suspension or imperfect aeration. A perfect aeration in the patient would remove this stage in every case. It would be a perfect cure.

In the second stage there is the soil plus the growing tubercle bacillus. The writer claims if the patient has enough healthy lung tissue to induce a fairly perfect aeration, and if he persists in getting the aeration, the aeration will remove the soil and *compel the bacillus to leave.* There is no longer a *food* for the plant growth.

This truth is worthy of consideration, and is being demonstrated every day in published records. Yet we have writers who are continually harping on systematic immunity, as if this were a thing to be had on asking. The writer thinks a systematic avoidance would be more proper. In most cases this may be had.

In the third stage of the disease there is disorganization or destruction of tissue. The lung may be broken down or gone. No power on earth can restore a destroyed tissue. The age of miracles is past. A knave or a fool may promise, but these promises are never fulfilled. While we say this, at the same time life may be prolonged by a judicious aeration of the lung that yet remains by an outdoor life.

The question may now be asked, what method or methods of aeration are best adapted to the individual patient, and in what locality? These questions, to be properly answered, would require a large open book to which we have not access or time to procure at the present writing.

SANITATION.

The word sanitation is used in the sense of erecting and equipping buildings for the segregation and care of the tuberculous, whether by private or public funds it matters little, the object being to care for or cure the patients.

Perhaps, to avoid misunderstanding, it would be well to define tuberculosis at the outstart. Tuberculosis is a constitutional disease, dependent largely on the evils of civilization and governed by the following law: The death rate from tuberculosis is in direct ratio to suspension of atmospheric influence.

It will be seen that the disease is spoken of as a constitutional one. Whether it be tuberculosis of the joints, mesentery, meninges or lungs, it is constitutional from its incipiency.

It will also be seen that the germ tubercle bacillus is not mentioned as a *causal factor*. That it is a factor in the disease we think no one can deny. The writer is emphatic in denying its causal action, hence the law: The death-rate is in direct ratio to suspension of atmospheric influence.

Our interpretation of this law is as follows: Suspension of atmospheric influence or imperfect aeration of the blood creates in the individual a soil or condition of tissue that allows a natural entrance or growth of the plant tubercle bacillus. The first stage of the disease, then, is the creation of the soil. The plant organism or germ tubercle bacillus then enters and commences to grow, or take root, in this prepared soil. The entrance or growth of this plant or germ is the second stage of tuberculosis. This growth is now a factor in the disease. What does it do? Hastens the third stage—breaking down of tissue or death of patient.

Our classification is a natural one, and is as follows:

First stage—Creation of soil.

Second stage—Entrance or growth of tubercle bacillus.

Third stage—Breaking down of tissue or death of patient.

Question: Can tuberculosis exist in the absence of the bacillus?

Answer: It certainly can.

How, then, do you diagnose tuberculosis?

We will speak of this later on. Perhaps a few remarks in another connection may not be out of place at this time. When this law, indicating a line of treatment, was given to the profession, there was not a sanitarium for the outdoor, physical culture method of treatment in the United States. To-day nearly every State in the Union is dotted with them.

The writer has devoted some time and attention to these subjects and he asks a little forbearance and consideration from the profession. While his dictum is not exactly the "Law and Gospel" in this matter it certainly points in the right direction. Should anyone doubt this he is referred to published reports of cures obtained now as compared with cures fifteen years ago. This will certainly convince the honest doubter.

We stated the object of sanitation is to segregate and care for or cure the tuberculous. Two things are patent to the observing:

1. The want of confidence, on the part of the physician, in his ability to treat or cure tuberculosis.

2. The ignorance or false education on the part of the patient regarding his ailment.

It is the common opinion of the medical profession that no tuberculosis is cured. It is the common education of the laity that all consumptives die of the disease. The physician and laity alike need instruction. If the physician have no confidence in his own ability he can inspire no confidence or hope in the heart of his patient. If the patient be told the nature of the ailment he at once loses all courage and gives up treatment in despair of cure. It is seen there is a fault on both sides, and it works one way. Treatment is given up. The patient goes steadily to the grave, as every-

one expected, and the doctor is not blamed. The time is coming when blame will be attached to ill-advised treatment and death, but that time is not yet.

As the writer takes it, sanitation would be beneficial in that it would place in charge of each building or location some competent medical man who has not only confidence in his ability to cure, but one who could inspire this confidence or hope in the minds of the patients by results in treatment. The rule would then work both ways, to the betterment of all concerned. This would certainly be a happy consummation—as Shakespeare would put it, "A consummation devoutly to be wished."

Having met personally over one-half the medical profession of Ohio in the sale of my third edition of "Tuberculosis or Consumption," the writer is in position to speak as to the consensus of medical opinion on treatment. These are common expressions of those who trust in drugs alone: "Nothing so disheartening," "My patients all die," "No results from treatment," "D—— the bacillus!" "Tuberculin is a fraud," "Have no confidence in anything," "Am afraid of the disease," "Will not treat it," "Turn over all my patients to others." Three physicians declared drugs would cure the disease, and named the drugs in confidence. Found on questioning they were using open-air and exercise in connection with the drugs (?). Listen to this: *"Everyone who has tried the open air and exercise has met with benefits explained in no other way."* Says one, "Don't the open air kill the tubercle bacillus? Are we not told the tubercle bacillus is ubiquitous? Is not the world full of air? Why is there a living bacillus? In other words, *why don't they all die?"*

Much as we all appreciate the worth of open air, it has not yet exterminated the bacillus. Can any one say that it ever will? But says one of our most talented Ohio men, "if open air be beneficial and cures tuberculosis, please give us the *modus operandi."*

We stated that imperfect aeration of the blood creates a soil or condition of tissue that allows the natural entrance

or growth of the tubercle bacillus. Reverse the proceeding. In other words, give the patient a perfect aeration and the soil is gradually removed, *i. e., the perfect aeration removes the soil.* Is the writer clear?

Let me illustrate: A train of cars is moving on a straight track at twenty miles an hour. Danger ahead! The engineer reverses the engine. What is the result? The train soon comes to a stop and then moves in an opposite direction. The physician who gives this perfect aeration to his patient and cures him is the engineer who reverses his engine and escapes danger. Is not his action to be commended and followed? It certainly is.

Have we made our position plain? *Every case of tuberculosis in the first stage can be cured.* Yes, but as yet there are no bacilli growing. How about cure when the bacilli have taken root, or in the second stage of the disease? Can one cure them? Listen to the author's reasoning: If imperfect aeration creates a soil, a perfect aeration would remove the soil. If the soil so created allow entrance or growth to the tubercle bacillus, when the soil is taken away, what becomes of the growing bacillus? It, likewise, disappears. It dies. It all hinges on getting the *perfect aeration.* In other words, if there be enough healthy lung tissue to induce a fairly perfect aeration, *if the patient persist in getting this aeration,* the bacilli disappear and the patient is cured.

All cases of tuberculosis, in the second stage, can be cured unless heredity be a factor. What do you mean by heredity? What does one inherit? He inherits a lung tissue that does not allow a perfect aeration of the blood. He inherits a thickened lung tissue and one not so elastic as the normal. One with this tissue must breathe more deeply or more frequently to get the same aeration as in health. For this reason a soil for the bacillus, in these patients, is cultivated more easily and when secured is more difficult to remove. *This is the main reason why heredity may be a strong factor in tuberculosis.* Bacteriology is *silent on this.* How can this peculiar lung tissue be changed or bettered?

In the generations to come, by the enactment of a marriage law.

In heredity, sanitary science can accomplish but little. The reason is obvious. Education must precede and create public sentiment. Without this, legal enactment would be valueless. This is seen in all temperance legislation. Without an education or public sentiment to enforce this legislation, it is worse than useless. A law that can not be enforced is in truth no law at all. To-day, the marriage question is one that suffers or tolerates no interference. The present state of public sentiment is against change. Education must take precedence. But just think of it! Every one of proper age can get a license, and what minister refuses to marry? Nearly all are allowed to marry, and the State indorses it. It is public policy, it is thought. The human race will deteriorate from this cause until some change be made. *Who dare advise a change?*

In the third stage of tuberculosis treatment is less satisfactory or more difficult. Here there is destruction or disorganization of tissue. One thing every physician should know, or at least he will ultimately find out: Lung tissue, disorganized or destroyed, can never be restored. It is gone forever. He who says he can restore is either a knave or a fool. All that can be done is to bring into requisition the healthy lung tissue that yet remains. Yet it is astonishing, in some of these cases, the amount of good that can be accomplished by simply comprehending the situation and acting accordingly. By feeding, out-door exercise, deep breathing, judicious use of drugs, etc., cases may sometimes be snatched from the tomb, or life prolonged in others. This is the most that can be done.

In all stages of the disease sanitation would be beneficial in that it would compel obeyance of orders as to diet, exercise, out-door life, etc. These are great factors in treatment and cure. They must be strictly adhered to, to receive permanent benefit. To the neglect of them in private practice may be ascribed the many failures in treatment. This

brings us to another phase of the question, which must be taken up at a future time.

We stated that the engineer who sees the danger and reverses his engine is the physician who recognizes the disease in its early stage and gives his patient relief and cure by a more perfect aeration—a very simple procedure, but one which many of our medical men are not yet conscious of. Suppose, instead of reversing the engine, the engineer entertain a peculiar theory and works on this. Imagine his theory, when a bridge is washed away, be as follows: A train of cars may be made to leap a chasm and strike the track on the opposite side by an increase of speed. At the first opportunity he puts his theory to test. Instead of reversing the engine, he pulls the throttle. The train leaps into the chasm, but the engineer never makes the experiment again. The reason is obvious. *All on board go to untimely graves.* It is an impractical or theoretical experiment.

This is but one of the many failures in medicine. History is full of them; one will suffice.

A few years ago a *savant* announced the tubercle bacillus the primary cause of tuberculosis—the injection of its alkaloid the cure for the disease. The theory is put to a practical test and thousands are hurried to untimely graves.

It will be seen that the analogy is complete, except as to the death of the engineer. The untrained yet believe in the experiment.

Were it more dangerous for the one having the experiment in charge, this foolishness would cease.

Why is this treatment fraught with so ill a result? The reason is clear. Many patients are crowded into imperfectly ventilated rooms, and the real cause of the disease given full sway. In this condition, should an impure tuberculin be injected it would further hasten the very disease it is sought to cure. Two dangers are seen:

1. Ill-ventilation—the primary cause of tuberculosis.
2. Impure injection, or, hastening of second stage.

Let us look a little further. Many have recognized the German scientists as authority on microscopy, which they

are, yet think their system of treatment needs a little bolstering, which it does. Notice the following: Sanitaria are started with the avowed purpose of using tuberculin, and reports of said injection are made from time to time with results as to per cent. of cures. At the same time open-air treatment is given to the patients of said sanitaria, and *no credit given for the same.* In other words, it is a mixed treatment of open air and tuberculin, but *tuberculin is given all the credit.* The writer thinks this manifestly unfair. The open-air and tuberculin treatment should each stand side by side as to their comparative merit. Not that we deny the right to use both tuberculin and open air in conjunction, as accessories each to the other, but that each so used *should be given its due credit in reports.* Nothing more.

It is then found that tuberculin is *nil,* as many observers have stated, while the open air is the best that medicine suggests. It is best in that it fulfills every condition and meets every requirement. It is truly the engineer's honest effort to reverse his engine on the straight track and cause the train to move in an opposite direction.

That these ideas are clear may be seen by a comparison of the open-air treatment on the one hand and the mixed treatment on the other. Tuberculin will then be shown as valueless. The writer so regards it.

Nor is this all. Tuberculin stands not alone in causing this widespread deception. The inhalation method is also guilty. There is this difference: The various methods of inhalation have value *per se,* but the value is not seen by the attendant in its true light. In illustration, the consensus of medical opinion on the action of tuberculin alone in treatment is *nil.* The same consensus on inhalation alone is that it has value. Why is the one of less value than the other in the estimation of the profession? Simply because the one does not fulfill the indications in the case, while the other does. "The proof of the pudding is in the eating."

As we have before intimated, in order to study tuberculosis in all its phases, and clearly discriminate as to com-

parative value of remedies, we must first clearly apprehend the nature of the disease. So long as we regard it distinctly germicidal, so long will we be misled in treatment. Nothing is more clear.

What is tuberculosis? A constitutional disease dependent largely on the evils of civilization, and governed by the following law: The death-rate from tuberculosis is in direct ratio to suspension of atmospheric influence. Suspension of atmospheric influence, it is seen, is the cause of the disease.

Having recognized the cause, we can more clearly suggest or devise a cure or preventive. No uncertainty in this. For instance, cold weather is at hand. More food, fuel and clothing are required. These must be had, or one must suffer. It is useless to speculate and say cold and hunger are relative terms, and exist only in one's imagination. Even a Dr. Eddy would appreciate a square meal or a good fire on a cold day. *Want and suffering are cognizant entities.* No mistake. So in tuberculosis. Impure or impoverished air must be rendered pure or wholesome. Imperfect or incomplete aeration must be rendered perfect or complete. Nature will not long tolerate a vacuum or poison in one's lungs or stomach. It is well that nature cries out for redress. *Redress must be had.* In tuberculosis this is truly the province of the physician.

The question now is: In what way can this redress best be granted? Is it best to imagine the disease does not exist? This is Dr. Eddy's method. Will the declaration that one-seventh of the death-rate is due to tuberculosis rid us of the disease? If so, it ought speedily to disappear. The writer thinks something more efficacious than these must be brought forward.

The inhalation method is a step in the right direction. What does inhalation accomplish? Of itself, but very little; as an aid to deep breathing—lung expansion, or a more perfect aeration—a great deal. Herein lies the true value of all methods of inhalation, viz., chest expansion or *the*

calling into use of latent air cells in the lung. Herein the fallacy, viz., that medicaments have value *per se.*

We stated that inhalation *per se* has little value. Let us endeavor to make plain our ideas in this connection. A sanitarium is started with the avowed purpose of curing tuberculosis by this method—inhalation. It is assumed first that the medicament, whatever it may be, applied to the diseased organ, will effect a cure. This, to the writer, seems an unreasonable assumption. Tuberculosis, as already stated, is a constitutional disease. Have we any therapeutic agent, a topical application of which will cure a constitutional trouble? Should a cure be so effected would not one of necessity consider it as a mistaken diagnosis—as local rather than a constitutional one?

In the second place, it is assumed that the remedy inhaled reaches the diseased tissue. This second assumption is as unreasonable as the first when we consider the residual air always present in the lungs. How can a spray or atomized solution pass through this residual air and reach diseased tissue? One can see how it could reach the throat, fauces, nasal passages, etc., but how reach the remote air cells?

Again, the diseased tissue is not always or entirely on the inner surface of the air cell. On the contrary, most of the diseased tissue is elsewhere.

How is a cure effected? This is generally seen. The patient improves. The improvement is accredited to the medicament or apparatus used—a natural sequence. Is this a true solution? That it is not the writer asks the following test: Place two patients, similarly affected, in adjoining rooms. On the one use the medicament and apparatus required, on the other pure air inhaled by a simple method. Be equally persistent in each case and compare the result at the end of any stated period. It will be found the improvement, in the main, is equally marked. Why the improvement? If the appliance or medicament caused the improvement in the one case, what caused the improvement in the other? The truth is, in either case it is caused *by a more*

perfect aeration of the blood. In other words, the more perfect aeration removes the soil and *the bacilli disappear.* The cure hinges upon the removal of the soil—a natural explanation.

As stated, the creation of the soil for the so-called germ is a violation of law. The observance of law, in proper inspiration and breathing, removes both *soil* and *germ,* and demonstrates, we trust, for all time, the utter nonsense of the germ causing the disease. Of this we hope to speak later.

In conclusion, sanitaria based on the idea that tuberculin or inhalation of drugs cures tuberculosis, in the judgment of the writer, is built on an unstable foundation. The structure cannot stand.

Truly, no portion of Scripture has been more clearly fulfilled in our age and generation than that pertaining to the crooked being made straight and the mountains brought low. Modern engineering has accomplished many remarkable feats. In no sphere is this more distinctly shown than in railroad engineering. Mountains are tunneled, chasms bridged or filled, curves or grades obviated, and the whole plan of the modern engineer is laid before us as a fairy tale or "Midsummer Night's Dream." These dreams of the intellect have been realized by clear, effective thought and action, thereby enhancing modern wealth and pleasure.

While we do not live so many years to see and enjoy as did our reputed antediluvians, yet we witness more in our brief span. *Age alone does not mark the length of one's existence*—rather deeds witnessed or accomplished. Many living men are very old, not in years, but in experience, which is more valuable.

Medicine has witnessed its many rapid evolutions. The causes of disease to-day are not the causes found as yesterday. We witness many, many changes, yet the tide of life moves on. We see more, know more, expect more of to-day. May our expectations be fully realized!

Experience in railroading has shown the cost of transportation is lessened by removing the grade or curve. We

are told "Experience is a dear school-master," and "Fools will learn of no other," yet it must be acknowledged it is *the truly wise who profit from experience.*

Medicine has many grades and curves. They cost us valuable lives. Let us endeavor to level and straighten. A valid reason is assigned for this.

Illustration: The engineer sees danger ahead. His train is on the grade or curve. How best proceed to stop? Reversal will not answer. On the curve it means derailment or death to all. The air-brake on the grade, if up, will stop the train; if down, it often will not. It is a time for lightning thought and rapid execution. *The* engineer acts quickest, wisest.

So in medicine. We meet our grades and curves. In dread tuberculosis they are most plentiful. Let us attempt removal. Experience should make us wise.

In treatment how best proceed in the third stage? Ask the engineer how best proceed in the conditions named. He will answer, "Little can be done." Give us the treatment in the later stage and we will amply pay. Listen to the engineer: "Better, far better, to remove the curve." The *Horseshoe Bend* in the *White Plague* is *causation curve.* Better, far better, to remove the curve. What? Throw aside the idol of our toils, the dread bacillus? Money squandered, labor wasted, time misspent—all are gone and what avails?

Let us examine. Ask medical science to-day for an accurate definition of tuberculosis, and it is somewhat as follows: Tuberculosis is an infectious disease caused by the tubercle bacillus, a ubiquitous vegetable organism which takes root in a suitable soil; the suitable soil in man is a depression of system, a lowered vitality, a dyscrasia, etc.

The attention is called to three things at this time:

1. The tubercle bacillus causes the disease tuberculosis.

2. The tubercle bacillus is everywhere present, and must have a suitable soil.

3. The soil for the tubercle bacillus is an indeterminate factor.

To any thinking man it will be seen *at once* that tuberculosis is not clearly understood. This misapprehension, for the want of a better name, we designate causation curve. This curve is costing thousands of valuable lives. As an engineer on the road we call for its removal. In other words, we ask that *the track be straightened.* Is our humble petition worthy of consideration?

What is tuberculosis? A constitutional disease, dependent largely on the evils of civilization, and governed by the following law: The death-rate from tuberculosis is in direct ratio to suspension of atmospheric influence.

Theories in their place are well enough. Theories and practical ideas are oftentimes diverse. Practical ideas are what we want in so dread a disease as tuberculosis. *What will relieve suffering humanity* is the question above all others that should be considered.

Have you a remedy for the disease? is asked every day. This remedy for tuberculosis has been chased for many generations, and, like the will-o'-the-wisp, with similar results. "An ounce of prevention is worth a pound of cure." The prevention of tuberculosis is *a removal of the curve.* It is found, in the main, in a more perfect aeration of the blood.

For many years we have entertained a beautiful theory regarding the motion of the earth. We now attempt to give it a proper airing in print. Remember, it is only a theory. As one looks into the heavens and considers the many planets revolving around central suns, he is led to ask why these bodies revolve and what power keeps them in place. Certainly some rational explanation should be given. We see nothing revolve on the earth's surface unless there be a power behind producing the motion. What reason can be assigned there is not a power or motive force at work on these planets?

On studying the subject more carefully one finds the motion of the planets irregular. He also observes all crank motion is irregular. The following syllogism is then

framed: All crank motion is irregular. The earth's motion is irregular. Therfore, *the earth is turned by a crank.*

In order to make the figure more complete, the earth has an axletree, which rests on gudgeons or bearings at the poles, and is turned by means of a crank.

Now if the earth be turned by a crank, some one must turn it, for it is evident cranks do not turn of themselves. Who turns the crank, however, is of minor importance, the important factor being, *does the crank turn the earth?* This is clearly demonstrated.

Now let us account for the irregular motion. This is clear. While John Chinaman stops to pour on more oil, the earth's motion is retarded. Or while Laplander Joe stops to spit on his hands there is a little variation in the motion—an uncertainty. This variation becomes greater when he is whetting an appetite for breakfast and returns after partaking of several pounds of blubber.

But, says one, "On what do these gudgeons rest?" In all probability *on runners.* It is known that at both poles there is an abundance of ice and snow at all seasons of the year. This affords excellent sleighing.

Says another, "What causes the so-called tipping of the earth?" This is due to the axeltree being more worn on one side than the other. In other words, the axle-tree *was not properly tempered.*

Now, having accounted for the deviations in the earth's orbit more satisfactorily than heretofore, we trust the explanation will be accepted in the spirit it is given. No serums. Even should the theory be rejected *in toto,* we feel assured it cannot be successfully controverted, for *no one has been there to see.*

If accepted, as no doubt it will be, we wish at this time to make a few observations. That there is, or ever has been, an open polar sea seems to us mere speculation. A ship could not pass through this so-called sea more than an air-ship could pass to the moon. An ice-ship could pass provided there were dogs enough to draw it. How to feed

a sufficient number of dogs is a question. This seems a clear inference from the above theory.

1. *There is a well-beaten track around each pole of the earth.*

2. *The arctic explorer could utilize this track in northern trips.*

So soon as this road is reached they, the explorers, should follow it for a time and then start direct for the pole *at the most auspicious moment.*

Presumably, as there are no fog-horns or signal stations on this road, a word of caution is necessary: It would be well *to keep a strict lookout for the car or sled. It might run down the dogs.* A loss of dogs in a polar expedition is *a sad calamity.* On reflection we think that it would be best to dispense with dogs entirely.

By establishing posts or feeding stations near this well-beaten track one could wait until the car passed and then *hang on behind.* Many medical men like to travel in this way. Some while thus traveling *reason in circles.* Others travel mentally in a loop and go in and come out at the same hole. But this is digression. "Let us return to our mutton."

It is said the inventor, Edison, keeps the idea of practical worth constantly in mind in all his experiments. Theories may be beautiful, captivating to the imagination, but *what is their practical worth* is the main question to be considered. Whether the tubercle bacillus, or soil for the same, be regarded the primary cause of tuberculosis, on this all agree.

1. *The soil precedes the growth of the bacillus.*

2. *The open-air treatment best meets the expectations of civilized man.*

The third is presented for calm consideration:

3. *The rationale of open-air treatment is found in the following law:* The death-rate from tuberculosis is in direct ratio to suspension of atmospheric influence.

A distinguished jurist once remarked in my presence: "The medical profession has done more for the better-

ment of mankind than has all the other professions combined."

Theologians might claim—and with some justice—this statement is not strictly true; that the preaching of the Gospel, if it alone *restrain men from doing evil,* is ahead of all that medicine can show. But this preaching not only prepares the individual for this life, but also for the life to come. Medicine deals with this life alone, and in many instances in *a very feeble manner.*

Our legal brother could claim the well-being of any people depends on just laws well administered; that the profession of law in this regard is head and shoulders above all others. We not only have made the laws, but have seen to a just administration of them. Medicine never framed a law and never saw to the administration of one. Why should it claim precedence above all others?

The painter could refer to his canvas as a living witness for all time. Medicine has no painted sheet on which an inspired multitude can gaze. True, there is no painted sheet, but this is the fault of medical writers alone. The physician has been busy doing good, and these good deeds have not been clearly displayed or shown to an enraptured multitude.

Medicine has modestly kept in the background and allowed other professions to shine. Let us step boldly to the front and assert our claim.

In sanitation medicine has done more than all other professions combined. *The life of mankind has been prolonged in the last century,* as the records of all insurance societies will show, and where stand law and theology? *Medicine stands preëminent and alone.* Has the practice of law led to a less need of it? Does the preaching of the theologian lead to a state of society in which preaching is not necessary? Are not law and theology just as requisite now as in the early days of civilization? If true, medicine stands ahead of its rivals, for it has pointed out and fostered a state of society in which it becomes less and less needful. Medicine, by the action named, has been actually

destroying its very life or existence. No other profession can claim this anomaly.

It is no more than fair that we should attempt to set our profession right in the eyes of all. We claim:

1. Forensic medicine should be represented by a secretary at Washington.

2. Family history should be a subject of public record.

3. No marriage without the certificate of a reputable physician.

Having shown that medicine alone has been foremost in the advance of sanitation or the lengthening of the average human life, should not this truth be gratefully accepted and recognized by a cabinet appointment? Would not the creation of the office and appointment to it enjoin an emulation in the body of the medical profession and thereby stimulate every good effort in the advancement of human welfare? Would not the medical profession, if so represented, consider it a mark of merit, and would they not unite and by a well-directed forward movement cause a general advance all along the line?

The author clearly and distinctly answers these questions in the affirmative. These truths have been held and maintained in our weak way for many years. Should they not be incorporated in the body politic?

In the study of disease so much is claimed that cannot be demonstrated—in other words, mere assumption is many times passed as clear demonstration. This ought not so to be. Take, for instance, the study of heredity in tuberculosis. The medical profession for many generations had regarded heredity a factor in the disease—a variable factor, sometimes more, at other times less. The germ theorist endeavors to set this aside and lay everything distinctly and emphatically to the germ alone. Practically, this does not and cannot work. If heredity be no factor at all, if the germs *per se* cause the disease, why do not insurance companies take risks on personal value, leaving out family history entire? *Why do they regard family history at all?* Some sentimental bacteriolo-

gists regard this the proper way to insure—leave out the family history. It does not work.

Insurance companies say if we regard examination of the subject alone, leaving out the family history, many applicants would be received on whom death claims would have to be paid in short periods of time. They prefer to take fewer risks and more responsible ones. No reliable insurance company could afford to do otherwise. Hence, family history is always regarded. The writer looks upon this latter statement as of practical worth.

Heredity is always a factor in tuberculosis. Not only are the insurance companies right, but their conclusion is a practical or common observation.

While thus writing, a certain family history comes clearly to mind. Grandparents die of tuberculosis. Four or five children, of mature years, die in as many different States of tuberculosis. A grandchild, born away from the environment of home and reared among other healthy children, dies of tuberculosis. "Seeing is believing." What is the use of one, with common perceptives, attempting to deny these ordinary verities? Yet such is done by parties assuming to be scientific men.

Heredity in any disease is worthy of consideration. Notably is this true in tuberculosis. To whom must we trust in getting a supposed impartial family history? *To those most directly interested,* generally to the family alone.

If a history be of value, ought it not to be found on public record? Where in this land can such public record be found? The writer has sought information of his legal friends and is assured: "No public record of family history in any State." We ask if heredity or family history be of public value, ought not this record to be in public keeping? Would it not be conducive to the public welfare? Let me illustrate.

Suppose Mr. A. wishes to purchase a certain property of Mr. B. He is satisfied with the price, but knows not as to the title. The public record makes this clear and the deal is made. Suppose Mr. A. wants the hand of Mr. B.'s

daughter in marriage. He is in doubt as to her family history. How shall he proceed to obtain it? Or suppose the daughter wants to know the family history of her suitor. Is it pleasant to inquire? Will some germ theorist arise and explain how this happy consummation may take place? How it usually does take place is known to us all. *We want to know the proper manner.* Is heredity to be regarded, or not? Shall we not use ordinary horse sense in dealing with marriage?

With the plants and trees and flowers—in truth, with everything we are associated—reared to the highest standard of excellence, shall we regard the human family of no practical worth? A greater care in selection means a higher development of the race. Are we not seeking a higher development? But say some, "It is impossible to legislate on marriage." *Education must precede legislation.*

The object of our talk is largely one of education—*creation of public sentiment,* which must always precede worthy legislation.

It is not necessary to teach the sane adult to keep the hand from the fire. He already knows the fire will consume. Along the line of heredity, or the transmission of disease tendencies, this same adult will walk as in the open fire. Nothing apparently restrains him. *Restraint has not been taught.*

Is not our present education on this line a false one? If false, let us correct it. *How better than by a public record that will allow every one to read and ponder, as in the light of day?* No one can object.

We now speak of the marriage relation as consummated at present. The contracting parties must be of proper age. This the law requires. It also requires the sanction of the probate judge or some other. The ceremony, as every one knows, is of much or little value. Please reflect! Did you ever hear of contracting parties being refused by minister or justice? It is simply "Do you love," etc., a little advice, *a very easy road.* Is it not actually true that any

human biped, of proper age, etc., may marry, *provided he has fifty cents in his pocket?*

"Like produces like," "the sins of the parents are visited on the children to the third and fourth generations," *we are taught.* Is it not wise *to insist on a greater restraint? Has not human society granted too great a prerogative to the one consummating marriage?* We think so. With our institutions for the imbecile, insane, idiotic, epileptic, deformed, etc., filled to repletion; with the State striving to rear all these, *is it not time to call a halt?* Would not a qualified physician in each community determine who is fit or unfit to marry? Would it not be wise to have one so appointed to act before a marriage could take place? Would this not lead to a higher type of manhood and womanhood?

We leave these statements for calm consideration.

CLIMATOLOGY.

The teachings of climatology in tuberculosis have been at variance for many years. On only one topic, so far as we recall, has there been a unanimity of the writers, viz., a new country is a desirable location for the tuberculous. Within the memory of many, the climate of Illinois has been regarded as the best; the pure and bracing air of Minnesota is vaunted to the highest; North Carolina and the pine woods are exalted without rivals; the extreme North and the extreme South have exchanged times of laudation and awakened interest; Arizona, New Mexico, and Colorado, regarded as the *ne plus ultra;* California, as the land without the diseases, etc.

Thus the ideal climate for the tuberculous has changed from time to time until it may truly be said to have included every state in the Union. As a matter of fact, the disease is prevalent in every state at the present writing. Why is a new country a desirable one? In order to more clearly comprehend the situation, let us endeavor to state the conditions as we find them.

A new country, or one without residents, is likewise one without houses—as ordinarily built and occupied—a bane to civilization. One going to such a country must needs put up with its so-called inconveniences; must live in the open or in any tent or shanty he may secure. This is ever the case. If this party be afflicted with tuberculosis, in any of its many forms and in its early stages, he invariably receives marked benefit. He observes he is getting better or growing stronger and taking on flesh. He at once ascribes his improvement to the climate in which he is living. Very natural. This patient may be an able man or one of worth, and his opinions or writings extend far and wide, as the case may be. Others listen and read his writ-

ings. One or more, likewise afflicted, journey to the same country. Some few put up with the inconveniences of the first and improve. Some few are hopeless cases, in the last stage, and die there, or by the way. Many more bring their home conveniences and friends with them. In other words these last simply change their location and *live as at home.* The climate does them no good and they and their friends condemn it and return.

Thus the tide, flood and ebb, has been running for many years and the disease baffles us as of yore. What is the rational explanation? Can one be given? Did the first party deceive in regard to the climate? Yes and no. One sees the commercialism of this age on every hand and he asks, did this first party have property to sell? No. Did he imbue the sanatorial instinct, so prevalent to-day? Perhaps so. These questions are pertinent. In the judgment of the writer, the first patient made the mistake of ascribing his cure to climate. A very common mistake and a natural one. One that is being made every day of the year. The cure was due to other things. Thus climatology here, there, everywhere, is being extolled or depressed. Let us talk for a time of these other things by which a cure is secured. It will repay.

Perhaps for the present it would be well to introduce our neighbor, the germ theorist.

Be it known there are some very good medical men who ascribe all sickness to a so-called germ. Every separate or distinct disease has its separate or distinct germ. There is a germ for cholera and another for variola, etc. It may be said in some diseases this particular germ is found—in others it is notably absent. For this, no matter, the germ has been there and accomplished its work: *The disease proves the germ.* So says the theorist, but in other words. At times the germ is discovered in both health and sickness. *In sickness it* (the germ) *causes the disease. In health it* (the germ) *lies in wait*—like an outlaw—*ready for an opportunity.* This is pretty but not logical. Why should not the germ cause health?

The author has long regarded some of the many methods of the theorist as foolish in the extreme. The conclusions lead, at times, to unwise legislation and the subjects of such law must suffer. We speak of this later. The particular germ that is usually found in tuberculosis is the tubercle bacillus.

A vegetable organism, microscopic in size, which is declared ubiquitous, *i. e.*, everywhere present. Now stop and think for a few moments: Everywhere present, inhaled and swallowed by all air-breathing or food-taking animals. Remember the germ is said to cause the disease. Why do not these air-breathing and food-taking animals become extinct? What is the answer? Avoid the germ or get rid of the germ and the disease is checked.

Legislation now follows along the line of germ isolation or destruction. "No spitting on the sidewalks." "One dollar, two dollars, five dollars fine for spitting in this car," etc., etc.

Do not misconstrue my teaching. Legislation on the line of cleanliness or æsthetics is right and proper. Legislation to prevent tuberculosis, by this method, is wrong and nugatory. Wrong in that the innocent suffer. Nugatory in that the disease still remains. The taxpayer must suffer. The author's idea on germs in tuberculosis has long been expressed: They are factors in the disease, but not primary factors. They do not create the soil. They enter the system and grow after a soil is created. The proper field for legislation is along the line of prevention of soil. This we have taught many years, showing how a soil is created and how prevented.

When these teachings are clearly recognized and properly carried out the progress of tuberculosis in this and other lands will be truly checked. Let us labor for this end.

We now look at climatology on the line of teaching of the germ theorist. He says the party or parties who went to the new country, taking his friends and home conveniences with him, also took innumerable germs. These germs

not only infected the friends, but also reinfected the patient. He did not improve, so all were obliged to return. In other words, could these travelers *have left the germs at home,* they would have been cured. This statement is certainly unique. Why ask the impossible? If germs cause the disease, one having the disease must necessarily take them with him when he travels. How could he leave them at home?

In the first case the patient is cured. In the second case he returns uncured. They alike traveled to the same country and alike carried germs in their persons.

Why the marked difference?

It is not explained on the line of germs at all, but *on the manner of living while in the new country.* Have we made this plain? When one considers that a soil must precede the entrance and growth of a so-called germ, it is readily seen: (1) If the soil be present the germ takes root; (2) if the soil be absent the germ gets no foothold; (3) if the soil disappear the germ disappears, and the microscope will show it. A true test. It is *the manner of life* in a new country that causes the disappearance of soil or effects the cure. If one live in a new country, as at home, —where the disease originated,—the new country does not effect a cure. It is seen a tuberculosis is curable.

A question now arises: Can tuberculosis be cured in every climate? Yes, but is not equally curable in all climates.

To put it, perhaps, in a plainer light, in all climates there are restricting factors to its curability. In some, these factors are greater than in others. It is the wise physician who selects the climate which has the *least* restricting factor for the individual patient. It is of these we shall shortly speak. My observations for many years have taught me this: Climatology in tuberculosis is vastly overrated. Change a patient's environment, change his home life, change his vocation in *his own locality*—in the main—can do more for that patient than to send him to a distant clime away from his friends and home.

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